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# It's Time to Listen When A Good Soldier Speaks

THE steel industry has been a good soldier ever since the recovery movement was inaugurated by the present Administration. From the first, steel companies have cooperated wholeheartedly with Washington to spread employment and raise wage levels. It is no exaggeration to say that what has been done, freely and willingly, exceeded what was asked or expected.

Engrossed in this constructive effort, the steel industry, up to now, has had relatively little to say about the recovery experiment as a whole. It has been content to do its own job well, hoping that the rest of the recovery program would show commensurate progress. But its hopes have not been fulfilled. Political experimentation has gained the ascendancy and recovery is lagging. Pending legislation, which threatens to incite class conflict, destroy flexibility in operations and impose intolerable tax burdens, is stifling latent enterprise and stopping the flow of private capital so indispensable to normal business revival.

The steel industry, as represented by leaders whose addresses are published in succeeding pages of this issue, has finally raised its voice in protest. It has no emotional bias in its attitude toward proposed legislation. Its view is the matter of fact one of recognizing and pointing out the dangers of measures that impede and threaten to nullify the unremitting efforts of a great business group to shake off the shackles of the depression.

After all, a good soldier merits respect and, if at length, he asks to be heard, it is time to listen.

# New Note Struck at

## Faithful Compliance Has Given Industry

OBSERVERS who have attended, with regularity, the annual meetings of the American Iron and Steel Institute, could detect something new and different in connection with the current one of May 23 at the Hotel Commodore, New York. The difference was not in connection with new faces among the membership, for there is little "turnover" from year to year in executive personnel of the industry. Nor was there expressed, by the speakers on the program, any inclination to advise the industry to depart from the strict adherence to the recovery objectives set forth through NRA which has signalized the steel industry during the past two years. The new note, reflected in the speeches and by the audience, was that faithful compliance had conferred upon the industry not only the right but the obligation to speak its mind, frankly and fully, upon trends in legislation and Government administration that are deemed to be contrary or antagonistic to the welfare of the industry and the public.

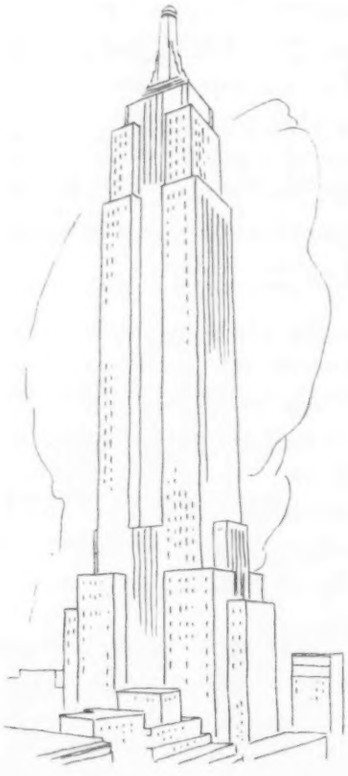
To put it figuratively, one might say that the honeymoon is over. To the words "love, honor and obey" will be added the phrase "object when n ssary."

And specific objections were registered in the addresses at this meeting. One of them had to do with the vacillating and shifting Government program, or rather lack of it, which has prevented the return of confidence and, through the intimidation of investors, kept steel demand from demonstrating the buoyancy which accumulative obsolescence and starvation diet of capital goods could easily give it, and would give it, under an assured and definite program.

Equally definite objections were registered by the speakers to the Wagner labor bill, characterized as perhaps the most notorious piece of class legislation yet attempted and designed for the sole purpose of enabling the American Federation of Labor to achieve, by Government mandate, what it has been unable to earn, either by merit or appeal.

Condemned with equal directness and severity were the 30-hour week bill, which would impose an impossible burden upon the industry, and the labor security bill, which would severely penalize those workers in the steel industry who are now enjoying greater benefits from privately instituted employment insurance and pension plans. In each case, it was shown that labor itself would be the loser through the operation of these impractically conceived plans, because of inevitable lowering of living standards.

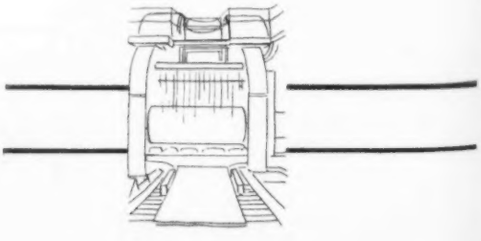
It was definitely indicated that the constitutionality of such acts would be challenged if they were successful in becoming law, particularly the Wagner labor act, which was characterized as driving a wedge between employer and employee relations.



### Reed Warns Against Panaceas

At the banquet, former Senator David A. Reed of Pennsylvania, warned against further political experimentation at a time when world-wide recovery is beginning to get under way.

"Recovery has come fastest," he declared, "in those lands, such as Australia, which have seen the futility of trying to legislate prosper-



# Steel Institute Meeting

## the Right to Speak Its Mind

ity through destroying wealth and piling mountains of restrictions upon the individual, and which have realized that this depression, like its many predecessors, can be solved only by hard work and thrift."

Calling attention to the unfortunate experience of Germany, Austria, and other nations with currency inflation, he quoted a sage as saying, "We learn from history that men never learn anything from history."

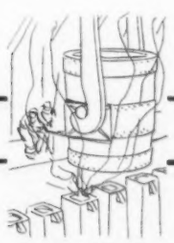
"There are many millions of our fellow citizens," Senator Reed declared, "who think that in the process of currency changing, there is some magic that will heal their wounds." They forget, he added, that the same leaders who two years ago recommended revaluation of the dollar as a cure for our ills are now urging unsupported emissions of currency. Yet, though the dollar was devalued, our troubles have persisted.

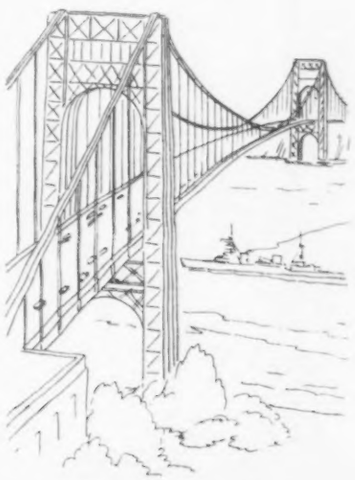
Referring to unemployment relief and old age pensions, Senator Reed declared that these can best be administered in the local units of Government, where circumstances and individuals can be known, where frauds can be detected, where the interest of the community lies in preventing unnecessary expenditure. The effort to administer these matters by a central Government in a vast nation, he stated, necessarily leads to incredible waste and unnecessary millions of public debt.

"Common sense in the end will win and the wasters and the tyrants will go back to the obscurity in which they belong," the speaker declared in his concluding remarks.

### Medals Presented

The Gary medal, which is awarded annually for most outstanding service to the industry, was presented by President Grace to John B. Tytus, vice-president, American Rolling Mill Co. A graduate of Yale, Mr. Tytus first worked in his father's mill. When that mill was destroyed by fire, he entered the construction business. But steel attracted him and in 1904 he entered the employ of the American Rolling Mill Co. as standing turn matcher and doubler in the sheet mills. He was soon advanced to regular rougher of a sheet mill crew. In 1905 he became assistant to the general manager of the Muskingum works of the company and from then on advanced step by step through the operating departments to his present position.





The American Iron and Steel Institute medal, awarded to the author of the most meritorious technical paper presented before a general meeting of the institute, was bestowed upon Edgar C. Bain for his paper, "Some Characteristics Common to Carbon and Alloy Steel." After being graduated from Ohio State University, Mr. Bain did further work at Wisconsin and Columbia. In 1928 he joined the staff of the research laboratory of the United States Steel Corpn. at Kearny, N. J., and subsequently was advanced to the post of assistant to the vice-president. In 1929 he was awarded the Robert W. Hunt medal and in 1931 the Henry Marion Howe medal. In 1932 he was Howe memorial lecturer and Campbell memorial lecturer.

At a meeting of the directors existing officers of the institute were reelected. C. R. Hook, president, American Rolling Mill Co., succeeded Mr. Grace on the committee on foreign relations. H. A. Roemer, president, Sharon Steel Hoop Co., succeeded S. E. Hackett, president, Jones & Laughlin Steel Corpn., on the membership committee. B. F. Fairless, vice-president, Republic Steel Corpn., succeeded Mr. Hook on the committee on tariff.

# Political Experimentation Retards

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NEARLY two years ago the President of the United States asked for the cooperation of American business in his efforts toward recovery. It is a fact that the response was general and the steel industry in particular was one of the first to lend its complete cooperation.

Since August, 1933, we have endeavored to carry out in the utmost good faith the provisions of the steel code then formulated and subsequently revised. We have acknowledged openly its obligations, and there should be a sense of pride in every member of this body that we have carefully and conscientiously given the Government our fullest cooperation. We have honestly and earnestly tried to apply and enforce those code requirements which were designed to right the wrongs of unfair practices and which provided for minimum wages, maximum hours and collective bargaining for the employees.

The results are tangible. The industry is employing 420,000 workers, almost a peak-time force; wage rates are above the 1929 prosperity levels. An unbelievable degree of self-government has been attained within the industry. Yet in spite of these efforts we have failed to achieve the desired goal, namely, recovery.

Five years of depression is a long pull. Certainly we have reason to be concerned that the average operating rate for the steel industry for the five-year period from 1930 through 1934 was less than 39 per cent, and the current rate is still only about 43 per cent. The financial condition of the steel industry indeed is an indication of how little reserve there is to weather any more adversity when we remember that the steel industry lost $268,000,000 in the three years 1932 to 1934 inclusive.

## Politics Is Chief Barrier to Recovery

Having done our part, we naturally ask why a greater degree of recovery has not taken place. I believe the chief barrier to recovery is political—the economic uncertainties underlying too many experiments and the proposals to regiment American business and labor.

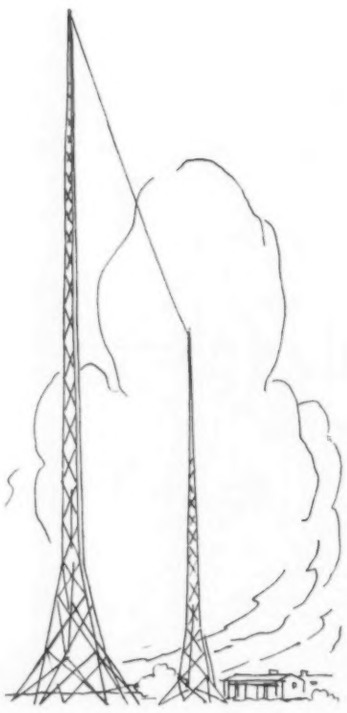
Business is ready to go forward. It is being halted by undue emphasis on reform, unsound, biased and perhaps even unconstitutional legislative proposals, political maneuvering, unrestrained public expenditures, currency tinkering and increasing tax burdens.

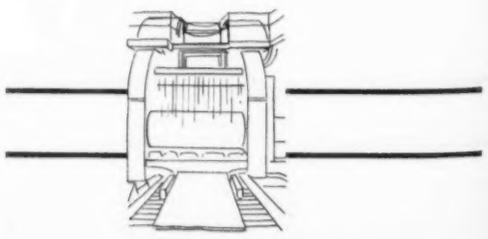
There can be no disloyalty on the part of those who have whole-heartedly cooperated, if at the end of a reasonable period they point to the results and ask for a rational consideration of the facts to determine where we are going and to voice their opinion that additional experimenting will not cure but probably will further delay recovery.

There are a lack of confidence and a lack of definiteness in planning for the future. We have not completely shaken off the illusion that we can spend our way to recovery, nor have we yet fully abandoned the vain premise that the way out is by high wages, high prices and restricted production.

## Industry Must Prosper for All to Prosper

To many has not yet come the realization that industry and commerce must prosper to make a prosperous world; that capital must be attracted into enterprise by the hope of reasonable profits from its use; that it is the creation and not the destruction of wealth that leads to prosperity; that high wages and





# Recovery

By EUGENE G. GRACE
*President, American Iron and Steel Institute*

high prices are the result and not the cause of prosperity; that restricted production produces less and not more income; that recovery and reform are two distinct problems and that it is unwise, if not unfair, to seek reform at the expense of recovery.

It is about time we had a little old-fashioned economy, that we encouraged efficiency and thrift, and stopped holding out false illusions based on the theory that the resources of the state are unlimited.

We are told that unemployment is the chief menace before the country. What is the answer to this menace? Is it to be found in permanent and socialistic legislation? I think not. I believe the answer is to be found in the reemployment in private industry of those normally attached to it.

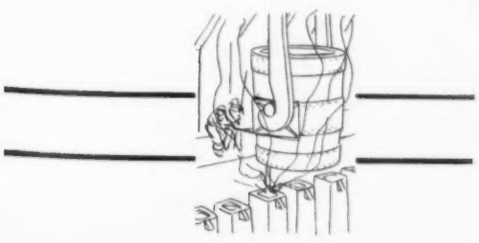
It may sound commonplace to say that the only real cure for unemployment is employment, yet many fail to recognize that if industry is saddled with restrictive and damaging legislation under which profits are unattainable it will seriously delay, if not completely prevent, the reemployment of normal forces.

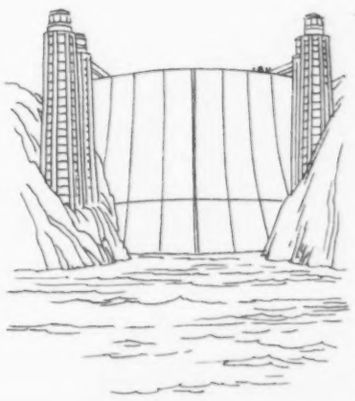
I believe that if an encouraging and constructive program were adopted instead of the unsettling legislative proposals now being considered, the chief barrier to economic recovery would be removed. This would give business the necessary confidence to go forward.

## Must Not Jeopardize Those Now Employed

Obviously, the relief of the needy is, and always has been, of prime importance. It is an emergency situation and should be handled on a strictly emergency basis. It is no new problem, has always been with us, varying in degree. It has never been necessary, however, to jeopardize the security of our employed population to alleviate want and suffering. Surely caring for the helpless and needy should not be made a political football.

As a practical matter, permanent recovery will return only through business becoming profitable. Take our own industry. Given the demand, we were never in a better position to forge ahead. The commercial structure has been purged of unsound practices. Consumers of steel products in planning their businesses now know where they stand. Our laboratories are diligently and effectively exploring the potentialities for new uses of steel. The relations between employees and management are cordial and cooperative. Large reservoirs of private capital stand ready to flow into private industry with a resumption in business. In a word, the internal economy of the steel industry was never better.





With a rise in the demand for steel all the elements will benefit. The real "forgotten man," the stockholder, might again hope for a return on his investment. The outlook for the employee is better than at any time in the past. With his present wage rate the only thing that stands between the worker and a prosperous pay envelope is restricted hours of work.

## Pent-Up Capital Must Be Released

Now, this will come about only when there is a return of confidence, resulting in both releasing and employing a free flow of private credit. Particularly will confidence stimulate the capital goods industries, upon which to a great degree a further upturn in steel depends.

We know that there are billions of dollars that could, should and

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would be expended to meet accumulated needs for replacement and construction if it were not for the economic uncertainties that are cropping up every day. Recent estimates have placed these accumulated needs to as high a figure as 80 billion dollars, enough to reemploy 10 million workers. The employment of private capital in this pent-up demand is then the real answer to sound and permanent economic recovery. In other words, money must go back to work. Then men can be reemployed.

I am old-fashioned enough to believe that only through private industry is it feasible to obtain the volume of business necessary to bring us back to normal times. Beneficial as nearly five billion dollars for public works and relief projects may prove to be, it would be well to recognize that this sum is less than 10 per cent of the country's normal annual business of 70 billion dollars.

Who are the advocates of these legislative proposals that are so undermining business confidence? Certainly they do not emanate from business men, nor recogized economists, nor for that matter from anyone who has a practical knowledge of economic history, nor do the proposals conform to the desires of the great mass of American workers.

## Business Thrives Only Under Private Management

By and large the champions of the proposition to interject the Government permanently into the field of private endeavor have had no direct connection with, or experience in, industry or business. They do not understand that the very basis of business progress is confidence and that Government regimentation or interference just automatically destroys that confidence and results in a slowing down of private industry. It is one thing for the Government to perform extraordinary functions in an emergency; it is quite another matter to enact permanent legislation providing for Government to perform those functions which normally ought to and best can be performed through private initiative. Such functions must be performed through private initiative if we are to enjoy the progress, prosperity and freedom which the Constitution contemplates.

The talent necessary to direct the private business activity of this nation is not found in Government. The courage, wisdom and skill necessary to properly conduct business cannot be found in the political arena. It will come only from people who have grown up in business. The road is an endless one full of hard work, thrift and sacrifice. It is the only one that will work. Carnegie and Edison were not products of Government.

## Government Should Not Come Between Employer and Employee

Business men are not alone in viewing these proposals with apprehension. Workers, too, are becoming alive to the inherent dangers. They are beginning to realize that many of the proposals said to benefit them will in the long run adversely affect their interests. They are beginning to realize that there are subtle influences at work on a well-planned program to alienate them from their employers. It is significant that this was one of the chief points stressed by the United States Supreme Court when it recently voided the Railway Retirement law. In delivering the majority opinion of the Court, Mr. Justice Roberts said:

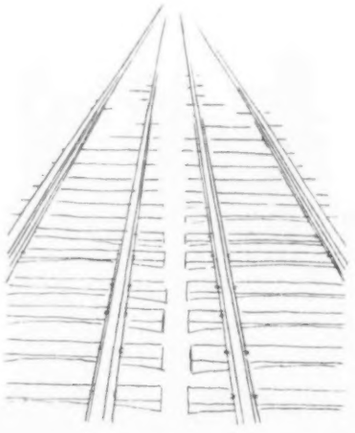
> Assurance of security it truly gives, but, quite as truly, if "morale" is intended to connote efficiency, loyalty and continuity of service, the surest way to destroy it in any privately owned business is to substitute legislative largess for private bounty and thus transfer the drive for pensions to the halls of Congress and transmute loyalty to employer into gratitude to the legislature.

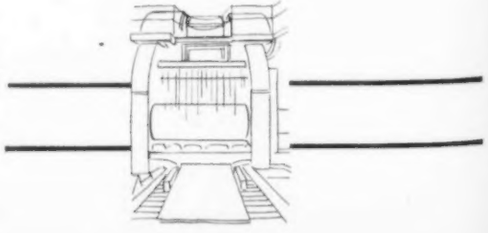
This opinion expresses the fundamental proposition which has made for many decades of successful industry in this country. It recognizes that peace and prosperity in industry rest upon the firm foundation of friendship and amity between employer and employee. If this fundamental truth were more generally appreciated, and if labor leaders and their sympathizers were by law held to an accounting for their acts and the moneys collected and disbursed, we would have far less meddling with business.

I feel, therefore, that this is the time to squarely appraise the principles and policies essential to a healthy and prosperous steel industry and to state our position upon current influences that are in conflict with the sound and constructive principles upon which our industry has been built, principles which we know through long experience to be right.

## Steel Industry Stands for Open Shop

We stand squarely for the open shop. We know this to be for the best interests of employees, employers and the general public. We believe our workers should be protected in their right to belong or not to belong to labor organizations as a matter of personal privilege. We believe it to be our duty to protect them in this right. Moreover, we believe that it is the duty of the Government to see that nothing is done to interfere with this, their constitutional liberty. We believe





in the principle of collective bargaining, and have practiced it for many years.

We subscribe to the doctrine expressed by President Roosevelt in the settlement of the threatened automobile strike a year ago when he said:

> The Government's only duty is to secure absolutely an uninfluenced freedom of choice without coercion, restraint, or intimidation from any source.

For many years employees and management in a number of industries have dealt successfully through plans of employees' representation. These plans, where in effect, have kept industry singularly free from difficulties. They have promoted efficiency and morale and bettered the standards of living of the employees. The steel industry has been an outstanding example in this field.

A fallacious and unfortunate view is held by people who do not understand, or by those who do not want to understand, the relationship that exists under these employees' representation plans. There are those who cling to the out-worn view that the normal relationship between employees and management is that of conflict, and the very fact that workers and managers in a particular company do not want to fight each other is evidence that something is wrong. They find it impossible to grasp the elementary fact that the interests of the employees and the management are mutual rather than conflicting.

With our background of experience over many years under employees' representation, we know that this method of cooperative collective dealing is better for all parties concerned than is the old outworn idea of strife and conflict with all of its attendant losses to the employee, the employer, and the general public.

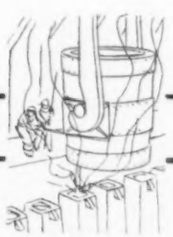
### Wagner Bill Is Vicious

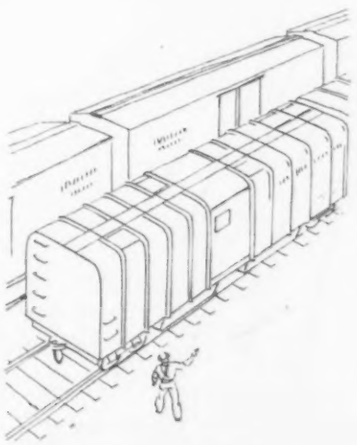
Now we are faced with a vicious legislative proposal that seeks to discredit these plans, gives legislative backing to national irresponsible labor unions and invites the closed shop. I refer to the National Labor Relations Act, commonly called the Wagner bill.

Here is a deliberate attempt to drive a wedge between the employer and his employees. Here is an attempt to do for national labor unions by law what they have been unable to do for themselves by appeals to workers who have resisted them at every turn. Eloquent proof of this can be found in the published record of less than 6000 dues-paying members in the Amalgamated Association of Iron, Steel and Tin Workers out of more than 420,000 employees in the steel industry.

We would, indeed, be lacking in courage as managers and citizens if we stood idly by and did not vigorously oppose a proposition that is so biased and manifestly unfair to both employer and employee. It has, indeed, been properly characterized as a "bill to create trouble." I repeat it is one of the most vicious pieces of legislation that has been proposed in a long time. Whether or not this undesirable bill actually becomes a law, the constitutional rights of employees will continue. Their right of freedom of choice both in employment and in selecting representatives will be protected by the steel industry to the fullest extent of our ability.

HONORED FOR CONTRIBUTION TO STEEL INDUSTRY
John B. Tytus, vice-president of the American Rolling Mill Co. receiving from Eugene G. Grace the Gary memorial medal.





### Thirty-Hour Week Impractical

Another disturbing legislative proposal is the bill limiting a worker to 30 hr. a week service. The steel industry believes in high

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* * *

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wages as evidenced by its record, but the effect of high wage rates is nullified if arbitrary restrictions are placed upon the earnings of employees. Our employees have had nearly four years of restricted working time. Personally I am opposed to anything which prevents a man from improving his earning power when opportunity offers. It is my firm belief that we will not attain a full measure of recovery until employees can once again enjoy the earnings of a normal working week of 40 to 48 hr.

The unsoundness of the 30-hr. week is so obvious that it is difficult to see how anyone who has at heart the welfare of employees and industry in this country can support it. Yet it is a measure that has received endorsement in quarters that do not or will not recognize its impracticability.

The steel industry under normal demand could not operate on a 30-hr. week; its operations would be crippled; the standards of living of its employees would be lowered. Some may think that it is possible to pay employees as much for a 30-hr. week as for a longer work week. They forget that selling prices have a direct relation to wages and that unreasonable prices would unduly increase living costs, stifle domestic business and still further handicap this country in world markets, where wages are much lower and working hours much longer than in this country. Freezing the earnings of employees to 30 hr. a week is not going to promote recovery in this country; on the contrary, it would bring about industrial stagnation.

If the working time were limited to 30 hr. per week, the earning power of the workmen in the steel industry, under normal conditions, would not be more than they earned in 1933 and 1934, which was a most unsatisfactory condition. The difference between 30 hr. and 40 to 48 hr. per week represents in one case the ability to obtain bare necessities and in the other case the enjoyment of comfort, pleasures and even luxuries with something laid away for the rainy day.

### Security Programs Best Administered by Industry

The steel industry has taken a vital interest in providing for the economic security of its employees. This it has done through cooperative plans. These plans have been both formal and informal. In some cases they have been financed wholly by the company and in others jointly by employee and company. In any event the steel industry has an outstandingly good record over many years in providing against the hazards of sickness and death, accident, unemployment and old age.

The partnership which has been built up in jointly administering these plans has been a powerful factor in promoting good relationships. The economic life of the

EDGAR C. BAIN
Recipient of American Iron and Steel Institute Medal.

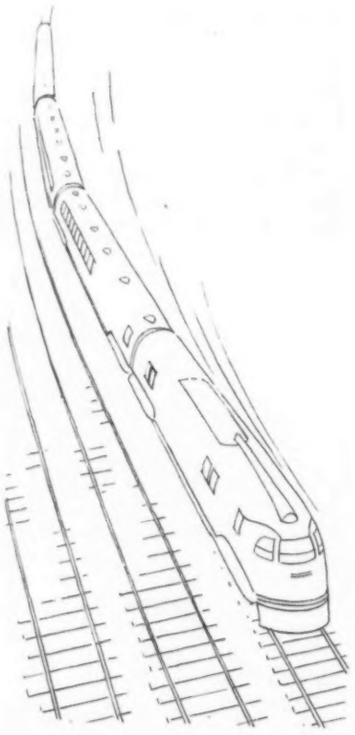
country has thus benefited. This is a contribution to national well-being that cannot be overlooked, because ours is a basic industry employing nearly one-half million workers.

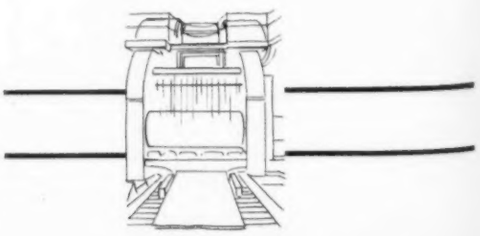
Now it is proposed that the Government shall invade this field. The economic security bill now pending in Congress involves far-reaching social and economic questions. Even though this were a proper function for the Federal Government, which I seriously question, the Government cannot, in the nature of things, administer these plans as effectively or as economically as private industry.

Security against the hazards of unemployment and old age dependency is a goal to be sought by all practical means. I have no quarrel with the principles, but the method by which this shall be accomplished, to the extent that it can be achieved, is of prime importance.

### Political Largess Is False Paradise

This country was built by our forefathers upon the cornerstone of economy and self-denial. Perhaps





"CARE should be taken that the emphasis placed on unemployment does not place in jeopardy the 42 millions of people who are still employed by heaping upon them and their employers unbearable burdens through extravagant and hasty legislation."

* * *

"The Wagner bill, the 30-hr. bill and the social security bill are only three of the pending measures, but they are typical of the tendency of many—more Government in business, more Governmental interference, more bureaucracy."

it is not too much to hope that the time will soon come when we will return to these first principles both in our public and private lives. It would, indeed, be unfortunate if our people are lulled into a false paradise and led to believe that political largess can become a substitute for private thrift and enterprise. Yet I fear that this unreasonable condition is developing.

### Taxes Would Retard Recovery

Proponents of the social security bill argue that the legislation is necessary to bring into line employers who have not provided these benefits for their employees. No thought seems to be given to the dire effects that will result from upsetting the programs that have been in satisfactory operation throughout this country over many years. Are these relationships that have taken years to build up not important in the economic life of our country? Are we to scrap them? And as Justice Roberts so well says "transmute loyalty to employer into gratitude to the legislature."

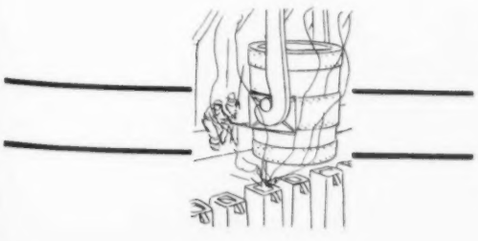
Then, too, it is a grave question whether the adoption of a program at this time, such as contemplated under the economic security bill with its heavy taxes upon business, would not in effect actually retard recovery.

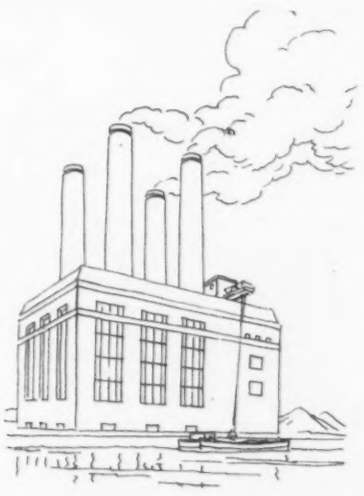
Care should be taken that the emphasis placed upon unemployment does not obscure and place in jeopardy the 42 millions of people who are still employed by heaping upon them and their employers unbearable burdens through extravagant and hasty legislation.

Certainly since the proposed legislation cannot be beneficial in the present emergency, for this legislation would confer no benefits upon those now unemployed, it would seem to be the part of wisdom for our legislators to give this far-reaching measure more consideration and study.

These are but some of the proposals creating economic uncertainties. The Wagner bill, the 30-hr. bill, and the social security bill are only three of the pending measures, but they are typical of the tendency of many—more Government in business, more Governmental interference, more bureaucracy.

Certain features of the pending banking bill, leading to political control of our credit facilities, give rise to serious concern. The Rayburn bill, restricting the activities of public utility holding companies, while designed to prevent abuses, at the same time has materially demoralized an industry which has been a large purchaser of materials in the capital goods markets. By the same token, railroad purchasing has been nil. And by what stretch of the imagination can captive coal mines, which are held for the purpose of supplying our steel mills with special quality coals, be included in a regulatory measure, known as the Guffey bill, applicable to the marketing of coal for general commercial purposes?





"WHATEVER the future of the recovery act," we should have the common sense to realize the necessity of exerting every possible effort to prevent a recurrence of the evils, abuses and unfair business methods of the past."

### NRA or No NRA, Common Sense Must Rule Steel Business

The question of the extension of the National Industrial Recovery Act, which expires June 16, is now before the Congress. Whatever the future of this act may be, if any at all, the problems with respect to the successful management of the steel industry are still before us and must be met. Certainly whatever the future holds in store for us, we should have the common sense to realize the necessity of exerting every possible effort to prevent a recurrence of the evils, abuses and unfair business methods of the past and of so managing our industry as to afford the necessary protection to all parties concerned.

The mismanagement of some businesses in former days, when discrimination and ruinous unfair trade practices were allowed to run riot, brought them under Governmental regulation. We do not have to think back many years for impressive examples of this. The fate of these businesses affords a real challenge to management.

We must recognize good business dictates that the only way industry in the long run can be assured of its inherent freedom to run its own affairs will be by the fair and honest treatment of its labor, its consuming public and its stockholders.

That we in the steel industry will whole-heartedly meet this challenge is my firm belief. Thus will we make our contribution to a new and better era.

# Outlook for Steel Is Best in Many

IT is my opinion that in many respects the outlook for steel and for business in general is considerably better today than it has been for a number of years.

### Huge Government Expenditures

In the first place, the Government is preparing to spend nearly five billion dollars. Now, regardless of whether or not you consider this a wise thing for the Government to do, the fact remains that the money is going to be spent, and this spending will have a very definite effect upon business. This money is going all over the country, and will find its way into the pockets of all sorts of people.

This money will go largely into projects which call for durable goods and heavy materials and equipment. That may result in orders for steel of the type which has been altogether too scarce in recent years. A large share of the money will go into payrolls. This will mean increased sales of consumer goods—and as a large share of our steel production now goes into consumer goods, it will mean increased sales of steel.

Now, entirely aside from Governmental expenditures, there is considerable evidence this year of a substantial business improvement. Employment and payrolls have been rising in the steel industry and many others. Automobile production this spring has been exceeded only a few times before in the history of the country. Public utilities have shown a consistent improvement in business—and they are a good barometer of general conditions, as they serve all types of people and businesses. This year farmers stopped crying for relief long enough to start buying automobiles and agricultural machinery. There has been some resumption of activity in various durable goods fields, particularly in machine tools. Even building is showing signs of picking up. This is particularly true of residential building. Real estate men and contractors are getting more inquiries with respect to home building than they have had for years.

All this shows evidence of a business recovery along normal lines, due to return of confidence, resumption of buying deferred through the depression years, and the desire of people to possess new and improved products.

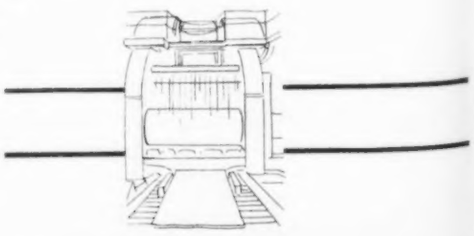
In any event, we can look forward to a growing demand for steel—and today the industry is in a much better position than ever before to fill the needs of present markets and develop new ones. We have developed new steels and new uses of steel to a point which was unheard of only a few years ago.

It is difficult to realize the extent to which research and invention in the steel industry may lead to replacement of a large share of the nation's industrial equipment. Consider, for instance, what the new alloys of increased strength and decreased weight will mean with respect to transportation, and factory equipment and machinery. Where new steels can do a better job than old steels are doing, new steels must come in.

The growing adaptability of steel to new purposes will enable it to supplant other materials in an infinite variety of fields. The automobile has demonstrated what may happen along this line in other fields as well. Each year more of the automobile is made of steel.

### Steel for Homes

In the near future I believe that the home may prove the outstand-



"THE outlook for steel and for business in general is considerably better today than it has been for a number of years. From the standpoint of markets, a number of influences point definitely toward increased sales and larger tonnage."

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"In the near future, the home may prove the outstanding example of replacement of other materials by steel products."

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"The Wagner bill, just passed by the Senate, is the outstanding legislative monkey wrench which today threatens to jam the wheels of recovery."

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"Notwithstanding all the political turmoil and confusion of the recent past, the Constitution still stands. It has not been, nor will it be."

# Years

By TOM M. GIRDLER
*President and Chairman, Republic Steel Corpn., Youngstown*

ing example of replacement of other materials by steel products. Just as the steel-built refrigerator has been replacing wood, steel will be used for cabinets, tableware, furniture—and even the house itself.

The fact is that steel goes into practically every device which has been invented to make life more convenient and more comfortable. Without the use of steel or steel machinery, it is doubtful whether a single product manufactured today could even be brought within the reach of the masses of the people. Steel is literally the master tool of civilization.

### Flays Economic Experimenters

Now, what I have said thus far has been quite optimistic. But it is not all going to be clear sailing. The signs show good times ahead—and I think we are going to have better times, unless economic experimenters keep on throwing more monkey wrenches into the machinery.

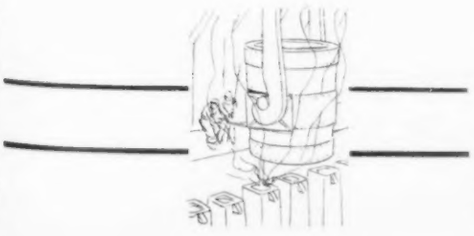
The Wagner bill, just passed by the Senate, is the outstanding legislative monkey wrench which today threatens to jam the wheels of recovery.

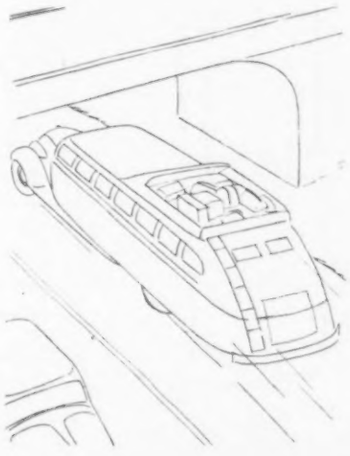
The enactment of this measure into law will plunge the country almost at once into a prolonged period of bitter industrial strife and litigation, such as the nation has never seen before.

The bill would place the Government in the impossible position of attempting to control the most intimate relationships between employees and employers in every community. As someone recently stated, it is difficult "to imagine a more complicated piece of legislation written to govern the prejudices, the passions, the disputes and the organization of upward of thirty million American workers."

Does any intelligent person believe that such a thing is possible?

There is no secret about the purposes of this measure. It was not designed to promote industrial peace. It was not designed to promote recovery. It was enacted upon the insistence of, and for the exclusive benefit of, the American Federation of Labor, and the one and only purpose behind it is to clamp the yoke of the closed shop upon millions of free American citizens.





I do not know how many millions of dollars in monthly membership dues would be exacted by the unions from the pay envelopes of the nation, if they were able to make this law accomplish all that they hope for. But I am not so sure that all their hopes are going to be realized. Vast numbers of employees in many great industries are carrying on collective bargaining successfully and I believe to their entire satisfaction through employee representation plans. In the steel industry and most other important industries, employer and employee relationships are peaceful and harmonious, and both men and management want to continue them so. Employees as well as employers realize that any interference with these relationships by outside influences would have a seriously disturbing and retarding effect upon recovery.

The modern method of collective bargaining through employee representation plans is a right which, in my opinion, will not be lightly given up by the employees in the steel industry. Yet, this is exactly what the champions of the Wagner bill seek to bring about. As you well know, the Wagner bill sets up a National Labor Relations Board, and confers upon it great powers. This board under authority given it by the bill, could attempt to outlaw practically any employee representation plan now in existence. The board is given absolute power to determine whether an employee representation plan is "company-dominated" by, among other things, the lending of financial or "other" support to employee organizations. What is "other" support? It could be interpreted by a partisan board as moral support, or any

other kind of real or imaginary support which would enable such board to declare that a plan was "company-dominated" and therefore outside the pale of the law.

Charles R. Hook, in his excellent radio address on the Wagner bill, summed up the case when he said, "this places in the hands of the labor board absolute power of life and death over employee representation plans."

Perhaps there has never been such a glaring example of one-sided legislation as this. Coercion by employers is prohibited, as it should be, and every form of possible restriction is placed upon the employer, but labor unions are expressly exempt from such restrictions. They can intimidate, threaten, or exploit employees in any fashion they desire under the protecting wing of the Wagner bill.

Less than two per cent of the over 400,000 employees of the steel industry belong to outside unions.

Are the vast majority of employees in the steel industry and many other large industries, who don't want to join unions and who don't want the closed shop, to have nothing to say about their own rights as free citizens?

As I said at the outset, business is set to go ahead and we are hopeful of increasing markets for steel, but industrial strife, such as may be stirred up if the Wagner bill is passed and upheld by courts, is bound to be a powerful retarding force upon business, and might actually offset the stimulus given by the forces now making for recovery.

In closing, I should like to leave with you just two thoughts. One is that notwithstanding all the political turmoil and confusion of the recent past, the Constitution still stands. It has not been, nor will it be, scrapped. The second is that the steel industry for generations to come will continue to be a leading factor in the economic life of this country. So let us pull together as we have for the last two years, demanding no special favors, but only our right to operate our business free from constant threats of paralyzing restrictions and intolerable burdens. If we can have this, I firmly believe that ten years from now we will look back upon a decade of activity and prosperity in the steel industry unequalled by any that has gone before.

# Swelling Imports Price and

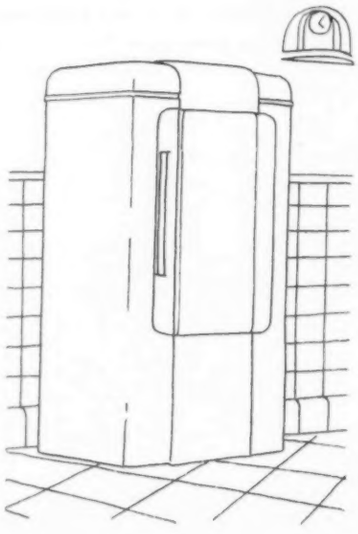
I SHALL interpret the topic assigned to me, namely, "A Review of the Year," as referring only to the steel industry and to that portion of it which is comprehended by the 239 producers of rolled steel products who are members of the steel code.

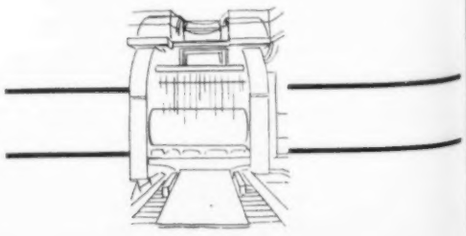
The average rate of ingot production for the 12 months ending Dec. 31, 1934, was 36.2 per cent, as compared with 32.5 per cent for the preceding 12 months. At present, it is around 42.8 per cent, having averaged 46.8 per cent since the first of the year. From these figures we may well derive a moderate degree of encouragement and justifiable optimism, although the progress upward toward a fair rate of operations seems distressingly slow and has been marked by disturbing retrogressions such as the one experienced by the industry in the last six months of 1934. It may be that similar disturbing periods may present themselves prior to reaching a sustained operating rate which conservatively may be regarded as a reasonable one. If this nation is again to prosper and progress, we must attain a stabilized continuity of volume.

"CONTENTION is made that importations, constituting a small percentage of the total tonnage consumed in the domestic market, have inconsequential bearing on the steel industry. However, a relatively small tonnage makes the market price at any given point, and with an increasing tonnage of low-priced product competing with domestic products, it is increasingly alarming to both labor and management."

### Lack of Tonnage in Durable Goods Persists

As had been the case in the first depression years, lack of steel tonnage was most pronounced in heavy tonnage products, in railroad purchases and, generally speaking, in the durable goods industries. This situation still prevails and no particular signs of improvement in that direction are as yet evident. This has been a sig-





# Threaten Domestic Wage Structure

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By W. A. IRVIN
*President, United States Steel Corpn.*

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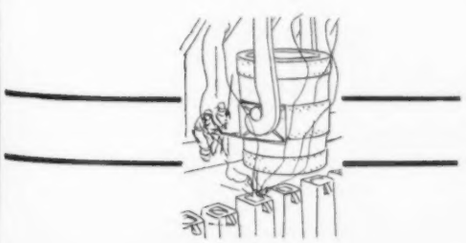
nificant feature and a startling development of the trend of our industry during the depression years. On the other hand, in contrast with the continued dearth of business in heavy tonnage lines, we have had the pleasure of experiencing improved demand in flat rolled products, particularly those required by the motor industry. Also there has been improved demand from farm implement manufacturers, from fabricators of wire products and a heavier tin plate consumption. Tin plate production promises to be exceptionally good during the present year.

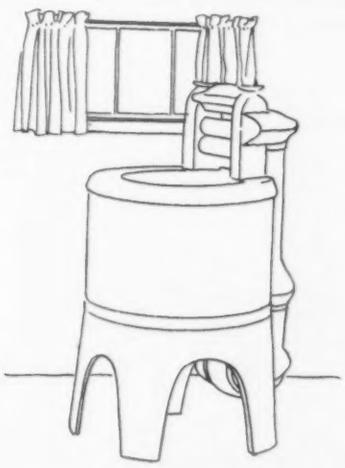
### Steel Industry Has Been Conscientious

We have now operated under the steel code for a little over 21 months. The steel industry during this period has been almost a unit in making a real and sincere attempt to carry out the mandate of Congress as expressed by it in the National Industrial Recovery Act, and in supporting the Administration in making this experiment in the interest of recovery. Whether or not it has helped recovery is not the point I am discussing. What I am trying to say is that irrespective of the wisdom or otherwise of the act, and irrespective of the success or failure of the experiment, we of the steel industry have done our part as well as we knew how, and have done it conscientiously, in an endeavor to carry out the intent of the recovery act.

Under the code, our filed prices are less than those ruling in 1926; our rates of wages were again raised on April 1, 1934, by 10 per cent, and are now 7 per cent higher than those of 1929. The financial return to the industry under these conditions has been disappointing, but this might be attributed more to the lack of orders in sufficient volume to permit economical operations than to either price level or the scale of wages.

During the year 1933, 190 members of the steel code reported total losses, before dividends, of $59,694,000. For 1934, 177 members of the steel code reported losses of $11,797,000. The loss for 1933 represents about 1¼ per cent and the loss for 1934 represents about ¼ per cent on an investment of $4,750,000,000.





### Alarming Rise in Steel Imports

A striking development of the year has been the increase of importations of foreign steel and the present tendency of these importations to assume larger proportions. For example, I will quote from statistics published by the Government, from which I have selected five typical items. These figures cover the months of January, February and March, 1934, and January, February and March, 1935:

Importations:

| | | Tons |
|---|---|---|
| Structural shapes | 1934 | 4,831 |
| | 1935 | 8,033 |
| Merchant bars | 1934 | 3,717 |
| | 1935 | 5,885 |
| Barbed wire | 1934 | 2,621 |
| | 1935 | 8,140 |
| Nails | 1934 | 1,745 |
| | 1935 | 3,694 |
| Steel pipe | 1934 | 1,896 |
| | 1935 | 3,924 |

All these figures are for three months only.

Summarizing these five items, the imports for three months of 1934 were 14,810 tons, and for the

same three months in 1935 were 29,676 tons, an increase of a little more than 100 per cent. The rate of ingot production in the United States in January, February and March of 1934 was only 40 per cent of capacity, and the rate in January, February and March of 1935 was only 49 per cent of capacity, so that this growing foreign participation in the scanty tonnage available in our home market was and is a serious matter to the steel industry, to our employees and to our stockholders.

### A Threat to the Price Structure

Steel producers are prevented from meeting this situation through equalization of American labor costs with the low labor costs of foreign mills. We are prevented not only by the provisions of the National Industrial Recovery Act itself, but also by the higher living standards which are generally accepted as being the desirable and proper standards for this country. It is, therefore, not within the power of the steel industry to correct this situation by reducing costs. From the financial returns of the years 1933 and 1934, which I have quoted, it would seem to be equally apparent that it is impossible for the industry to correct the situation by reducing prices without at the same time inviting bankruptcy. The disparity between foreign steel prices landed at points on the Atlantic, Gulf and Pacific Coast ports and current prices of our own mills are many dollars per ton. I would say a disparity of $10 to $15 per ton is not uncommon. This situation can be materially helped by making use of one of the several methods provided in our present laws, either the anti-dumping law or an increase in the amount of duty under the flexible tariff law, or by an embargo under the National Industrial Recovery Act. The American steel industry has not, up to the present time, been assisted under any of the provisions of these laws. However, the effecting of reciprocal trade agreements with certain foreign countries, whereby very low rates of duty are established for certain steel products imported into the United States, have tended and will tend to reduce prices to still lower levels. The reaction of this on the interests of the steel industry in the aggregate is at once apparent.

It is recognized that contention is made that these importations, constituting a small percentage of the total tonnage consumed in the domestic market, have inconsequential bearing on the steel industry. It is true that 10,000 tons per month in these five items—shapes, merchant bars, barbed wire, nails and steel pipe—is not relatively large as compared to the total consumption in the country. However, as we all know, a relatively small tonnage makes the market price at any given point, and with an increasing tonnage of low-priced product competing with domestic products, it is increasingly alarming to both labor and management. This is more important today, when steel plants are operating at 40 per cent and labor is reduced to 35 hr. per week.

### Growing Diversity of Imports Causes Deep Concern

The increasing tendency in the volume and diversity of these importations are causes of deep concern to our domestic steel industry. These importations are penetrating into our markets far beyond the Atlantic, Gulf and Pacific seaboards, and likewise into the Lake port areas during the season of Lake navigation, with resulting tendency to induce demoralization in the marketing of the products distributed in these areas.

In conclusion, let me venture to make this statement as to the immediate future. In my opinion, the degree of industrial activity which may develop is dependent largely on the outcome of pending legislation directly affecting industry. After more than four years of necessary and enforced retrenchment, natural recuperative forces are bound to stimulate and effect recovery unless checked by further burdens and restrictions on industry.

# Depression

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By CHARLES M. SCHWAB

*Chairman Emeritus, American Iron and Steel Institute*

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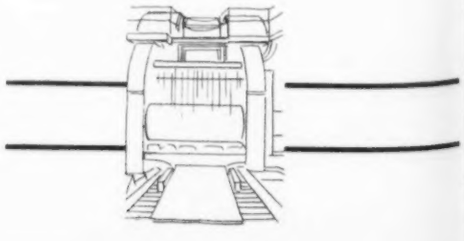
I WOULD like to turn back for just a few minutes to the old days, because I think it may give us something of a sense of proportion to realize how far we have come in so short a time. I think we ought not to be too blue about some of our troubles as they come along, when we stop to realize that our industry is still very young.

It is amazing to me to think that this business has grown up practically in my own lifetime. Everyone calls steel the basic industry, and it is. Yet it has become the basic industry within the past 50 years.

Of course, steel in small quantities has been available for centuries, and as early as 80 years ago it was being supplied for railroads and steamships. But the enormous use of steel in buildings and in every department of industrial development is a modern thing.

I like to think along the years and to realize that our industry has always been forward-looking.



# Proposals Imperil Initiative

"WHILE it may not be of any great moment to those of us who are further along in life, it is certainly a challenge to the youth of this nation, upon whom its future depends, to decide whether the proposals that are wrought out of hard times are going to, in the long run, stifle the individual initiative which has developed this country."

We have pioneered. Sometimes we have developed new uses for steel and found markets for them. At other times the needs have come along first and required steels of new specifications. Whichever way it has been, the industry's meeting of the situation has called for ingenuity, daring and enterprise.

When I consider the many millions of dollars which are being put into the building of new mills today, I admire the job which you managerial fellows are doing and the courage you have in accepting the colossal responsibility involved in deciding on affairs of such magnitude. I know that these decisions are often guided by laboratory tests, and I think back to the first thousand dollars that I borrowed in my life. I got it from Henry Phipps to set up laboratory experiments, but I soon learned that this was only the beginning. The proposition that proves out in the laboratory or in the experimental mill may fall down in the day-to-day demands of plant production. That is why I say leadership in the steel industry requires men not only with theoretical knowledge but also with "know-how," practical experience and courage.

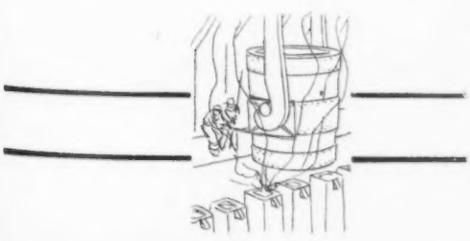
### Will Individual Initiative Be Stifled?

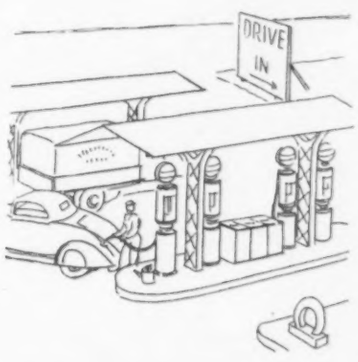
You may wonder why I have addressed myself particularly to the younger men in this industry today. I have done that because of some of the philosophies which often are heard today. While it may not be of any great moment to those of us who are further along in life, it is certainly a challenge to the youth of this nation, upon whom its future depends, to decide whether the proposals that are wrought out of hard times are going to, in the long run, stifle the individual initiative which has developed this country.

While we all admit that no great advances are ever made without the development of some features which need correction, the challenge to the young men of today is to avoid the heaping upon themselves of burdens and suppression of individual initiative that will prevent the same opportunities to acquire property, security and some of the luxuries of life that have been the rewards of the past.

Our industry has progressed, and has had a fine history along humanitarian lines. Public thinking goes back to the earliest days of the industry when working conditions of employees were in a primitive state, but that was long ago, and I would like to emphasize the fact that for years this has been an industry of good wages and good opportunities. Nearly all of the men who are in the high places in the various companies today started out as poor boys. There was never any question of having an inside track, or being related to somebody. The industry was always reaching out among its employees trying to find men of ability.

You know, ours has always been a human kind of a business. A steel mill is not like the type of factory where the worker is the slave of the machine. We have had these collective bargaining arrangements, as your president has said, but there has always been free interchange of views between workers and superintendents, and those higher up. You couldn't work effectively otherwise.





Mr. Grace has said a word about this institute. I can remember when it started out just as a series of dinners given by the late Judge Gary. It was nothing like the great, useful, public-serving institution of the present day, but we were groping with a realization of the fact that we were founding something which some day might grow into greater usefulness.

As a matter of fact, it was through the institute that the abolition of long hours of work was started, with a gradual change over to the 8-hr. day, which is now standard. And we pioneered in the collecting of economic data on our industry.

I am not dwelling on the good old days with any thought that I think they were better. I have already said that you young men are going way ahead of what has been done in the past, but I think it is worth while for you to stop a moment and realize what came before you.

### Correctives Should Not Shut Door to Opportunity

We who have been in business for many years do not attempt for a moment to say that there have not existed conditions that have needed correction. The note which has been sounded by your president setting forth the evils of throat-cutting and bad business practices under which workers, stockholders, the public, and everyone were losers is a condition which should not ever be allowed to exist in the business structure of the future. You men here have proved that you are statesmen enough to recognize the unsoundness of these practices in the way you have conducted yourselves over the last few years and I want to offer my most hearty congratulations on the good sense and good business judgment you have shown.

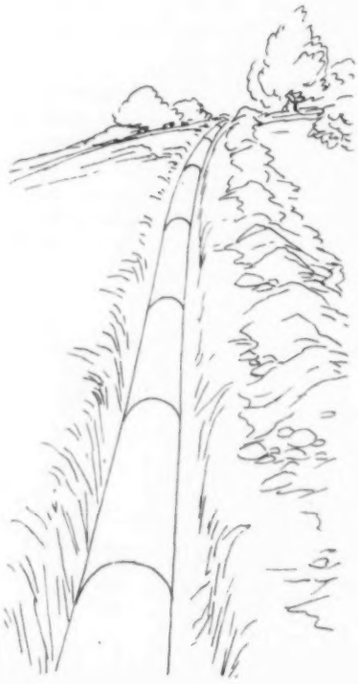
No one can fairly object to the correction of obvious mistakes and abuses which are the by-product of all progress. It is my earnest hope, however, not so much for those of us who are rounding out our full span of active service, but for you younger fellows—it is my earnest hope that the corrections will not be so extreme and unreasonable as to tie down the oncoming younger men and deny them their legitimate opportunities.

I need only to think about how rapidly this nation has developed in order to reaffirm my position as an optimist. I know that my optimism has been regarded as a chronic ailment, and that if I even give voice to a touch of pessimism all the newspapers seize upon it as news.

### Common-Sense View Will Ultimately Prevail

But, boys, my optimism is more than just a general feeling of hopefulness. It is based on the fact that I have seen so much take place during my lifetime, and have seen the trend always improving. The civilization that we are in right now, with all of its drawbacks, is a big step ahead of 50 years ago. And that is true on the human side as well as on the material side. I am sure that the world is going to keep moving ahead, and this meeting today makes me feel so all the more.

I believe that the common-sense view will ultimately prevail. I believe that with the reassurance of business we will again see our working population fully and happily employed; that industry will be operating on a profitable basis; and that the American people will again enjoy their heritage of resourcefulness and courage, and keep advancing to a fuller and richer life.



# Progress

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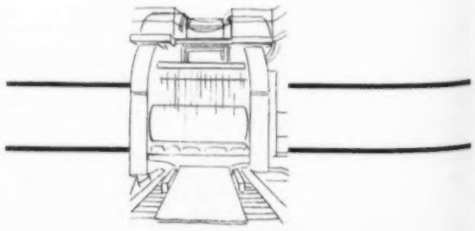
By FRANK PURNELL

*President, Youngstown Sheet & Tube Co.*

o o o

I WANT to explain at the outset that this talk was to have been made by Mr. Weir, but as it happens, he is unable to be present today. I wish to take this opportunity to express my admiration for the courageous stand which Mr. Weir has taken with respect to his labor situation throughout the last two years—and my compliments go particularly to the employees of Mr. Weir who remained faithful to their convictions and stood up fearlessly on behalf of their employee representation plan.

The progress in labor relations within the steel industry over the last few years, in my opinion, has far outstripped that in any other basic industry. Some of the companies at the request of their employees, over 15 years ago entered into the representation plan whereby the employees elected representatives to deal with the management in reference to wages and working conditions. Other companies kept in close touch with their men through various supervisory forces, such as superintendents, foremen, etc., and in that way tried to dispose of individual cases. In a few rare instances, contact was had through an outside labor organiza-



# in Labor Relations

"EMPLOYEES throughout the steel industry have overwhelmingly shown their preference for employee representation plans. I do not believe these employees will submit to the dictates of those who seek to force upon them, by legislation or otherwise, a type of collective bargaining which the employees have emphatically shown they do not desire."

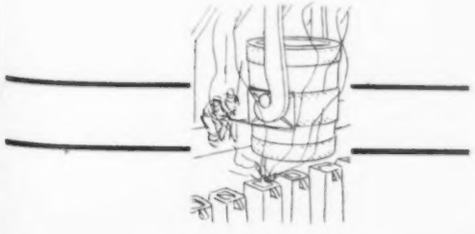
tion, although such cases in the steel industry have been very few due to the unsatisfactory experience which practically every company has had.

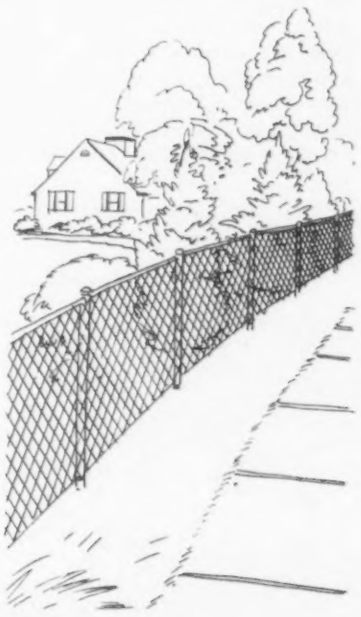
### Steel Employees Favor Employee Representation Plan

Within recent years, practically all of the employees in the entire steel industry have adopted the employee representation plan of collective bargaining and negotiating their conditions of employment, and it is my opinion that any fear that may have existed at the beginning either on the part of the management or the employee of bringing all problems out on the table for mutual discussion and honest settlement has been eliminated. I do not know of a single manufacturer, nor have I heard of any large group of employees, who would want to revert to the old time arms-length method of dealing with each other.

These facts should correct the misapprehension of those people who believe that the employee representation plan is something new. In our own company, for instance, such a plan was inaugurated some 17 years ago and our records indicate that since its inauguration, interest has increased as the years have gone along. Of course, it would be unfair to say that at the beginning all things were satisfactory to either side, but we can say with positiveness that as time goes on there is a better understanding of each other's problems and that the relations of the employee, the company, the stockholder and the public are more thoroughly understood, and decisions giving consideration to all of these factors are, in almost all instances, arrived at through fairness and mutual understanding.

It cannot be emphasized too strongly that any successful plan of dealing with employees must be founded upon the basic principle that there can be harmony and mutual consideration between employees and employer, upon honesty of purpose, freedom of speech and due regard for the rights and aspirations of both. They must work out their problems together, in a peaceable manner, instead of in an unnatural condition of hostility. The steady and successful operation of a manufacturing plant is a matter of common interest both to the employees and the employer and, therefore, operating problems should be discussed and settled by workmen and management for the benefit of both.





Under employee representation plans, the employees are represented by men whom they know personally and who are chosen and elected from among themselves. These men are naturally familiar with plant conditions and personnel because it is their plant—and when they bring up a question on behalf of the men whom they know and represent, they know what they are talking about.

This, in my opinion, represents one of the most decided advantages which employee representation plans have over the professional labor union.

Those of you who are familiar with employee representative meetings will understand how important this is. While, naturally, most of the questions arising at these

meetings have to do with wages and working conditions, it is amazing to see the number of little things which employee representatives bring up—especially details covering various aspects of working conditions. These little things have to be taken care of. If they are not, they rankle in the minds of the men and eventually lead to serious grievances.

A professional representative of a labor union, located outside a plant, cannot possibly have an adequate knowledge or an understanding of these details. Neither can the executive of a company be expected to have full knowledge of them. The only way in which they can be brought to light and remedied, if they are wrong, is by the employees themselves, who bring these questions up through their employee representatives.

Furthermore, employee representation plans provide for day-to-day and localized action. Issues which arise may be brought up and discussed immediately over the table —and local matters pertaining to each plant may be taken up and settled in a manner most satisfactory for that particular plant. This type of action is impossible under professional labor union organization.

### Individual Rights Guaranteed

Employee representation plans guarantee the rights of the individual, and any employee may raise any question he wishes at any time. In a general way the procedure is as follows: An employee first presents his case to his foreman. If he fails to receive satisfactory settlement, he then presents it to his elected representative, who takes it before the representatives' committee, and if passed upon by the committee, it is submitted to the management for discussion and action. In case of failure to obtain mutual approval, it may be presented by the employee to the president of the company, and if it is impossible to reach an agreement satisfactory to the employee, many of the plans provide for submission to outside arbitration if desired. The very fact that both the employee and the foreman, who are usually the first contact, know that the question can be submitted inspires them to attempt to reach agreements between themselves, and those having experience under such plans have found that many of the cases are settled promptly on the job before there is any chance for misunderstandings.

These plans encourage the development of individual initiative, ability and capacity for leadership. They are distinctly representative organizations, founded upon truly American principles.

Wherever a representation plan has been honestly accepted and tried out, both men and management have been heartily in favor of it. But, of course, it must be sincerely undertaken. Management cannot expect a representation plan to operate satisfactorily if management goes only half-way.

Some people outside the steel industry seem to think that steel workers are uninformed if not ignorant and incapable of knowing what is good for them or of looking out for their own interests. We, who work with them, who know many of them personally, know that practically all of our steel workers are reasonably well educated, many of them with high school training or better. They read the newspapers and are well informed on issues affecting them and industry and the country generally; they listen to the radio and attend the movies, hearing and seeing important news events of the day. They know what is going on in their own and other industries as well as in the country at large; they are familiar with conditions and have their own opinions on business and economic subjects. They are well equipped to bargain for themselves and to choose men from among their own number who have the ability and the integrity to represent them ably in collective bargaining with their managements. They meet and know their representatives and have ample opportunity to discuss with them any problems concerning their department or works and the employer-employee relations, in which they are interested.

### Company Problems Should Be Placed Before Employees

I believe that it is the responsibility of management today to maintain close and intimate contact with its employees not only for the purpose of discussing wages, working conditions, housing, recreation, education and the like, but also for the purpose of placing before them some of the larger problems of the company and the broader aspects of its position.

This brings up another aspect of employee representation plans to which I think not enough attention has been paid. It is true that one of the main purposes of these plans has been to enable employees to present their cases to the company. But it is equally important that the company have an opportunity to present its case to the employees. After all, the company is entitled to have its position given due consideration by its employees —just as employees' problems are entitled to due consideration by the company.

It is my opinion that you cannot have an unprosperous industry and prosperous labor any more than you can have a prosperous industry and unprosperous labor, and, therefore, mutual understanding and harmony between those best informed are absolutely necessary for satisfactory working relationships.

### Employee Representation Plans Gaining Popularity

Perhaps the best proof of the efficiency of employee representation plans as a practicable workable method of collective bargaining lies in their growing popularity among employees and in the nature of the questions settled under the plans and the method of their settlement.

As you know, the American Iron

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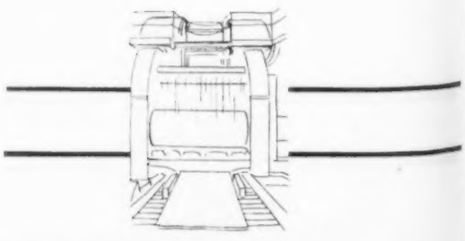


# A Review of Code And Institute Activities In the Past Year

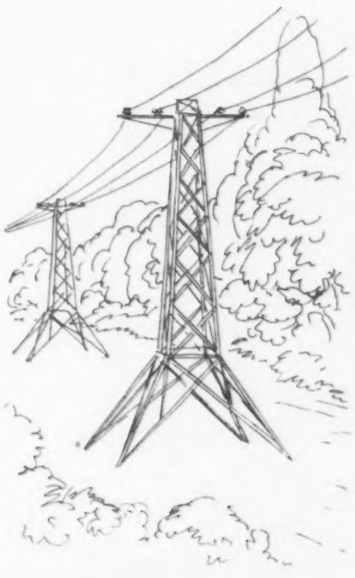

By WALTER S. TOWER

*Executive Secretary, American Iron and Steel Institute*


THERE are two groups of activities which engage the staff of the institute: first, those which relate to common interests of its members; and second, those which relate to the operation and administration of the steel code. I shall try briefly to review those activities as they have been carried on during the past year.

Looking first at the institute as a focusing point for cooperative activity by members of the iron and steel industry, I should like to remind you that the institute was active in some lines long before industrial codes ever were dreamed about, and that the institute may well continue to be active, even more active, in the interests of the industry for a long time to come, irrespective of the future of industrial codes. As a matter of fact, I believe it is true that the institute and its predecessor association together represent one of the oldest organizations of members of an industry anywhere in the United States.

Although the institute itself dates only from 1908, its roots run back for 80 years, and some of the activities now carried on by it have been more or less continuous from that early beginning. For example, there are statistical records which have been made for the industry almost without a break during that long interval, and directories of concerns engaged in the iron and steel industry have been published from time to time by the institute and its predecessor since before the Civil War. I believe the first of these was dated 1858.



## New Steel Works Directory Being Completed

There are, therefore, among the routine activities of the institute, some of very old standing which are being continued along with new activities that have been undertaken more recently. In the light of these facts you may find added interest in learning, if you do not already know, that during the last five months a complete revision of the directory of iron and steel works has been under way, and is now ready for printing. It was planned originally to have the new directory, the 21st of its long line, in your hands before this meeting, but unavoidable delays in obtaining and compiling the necessary detailed data have retarded the job, until it now seems that the directory cannot appear before early June. It is believed, however, that the revisions which have been made, especially in the manner of presenting some of the information, and certain new features which have been added, will greatly enhance its usefulness and will well justify the added length of time which has been devoted to its preparation. In this work of re-

vision, indispensable help has been given to the staff of the institute by members of the statistical committee.

Similar consideration is being given to revision of the annual statistical report in order to make it more conveniently usable and at the same time to bring it more closely into accord with current statistical practices among members of the industry. It now seems likely, however, that the statistical report for 1934 cannot be ready for distribution before the end of June, which is a much later date than should ordinarily be the case if that report is to serve the best uses to which it can be put. As a matter of fact, I can see no good reason why the annual statistical report should not be available at least before the first of May in any year—possibly before the first of April—if all members of the industry would fully cooperate with the institute in furnishing their statistics of production promptly after the close of the calendar year.

### Industrial and Public Relations

One of the chief of the newer activities which deserves mention is the work of the committee on industrial relations in studying, and advising members of the industry in respect to, various proposed pieces of Federal legislation which, if enacted into statutes, would have far-reaching effects on the business of every member of the industry. I refer particularly to the so-called Wagner labor relations bill, the social security bill, the 30-hr. bill and the like. As a result of the efforts of that committee, collectively and through its individual members, it appears that much has been done toward developing an industry-wide common understanding and united front on such matters of vital importance. Study also is being made of other sorts of questions which may deeply concern members of the industry. As a means of keeping track of proposed legislation or other developments which may be of interest to iron and steel producers generally, it seems that the committee on industrial relations, as now organized and functioning, is in a position to render one of the most important services undertaken by the institute for the benefit of its members.

Another new and growing activity which merits special mention is the work of the publicity division in making generally available to the public current facts relating to the industry. That division has been in existence only since November, 1933, but it seems to me that the results already obtained, especially during recent months, show the wisdom of the decision which was then made to break away from the old tradition, and consistently undertake to see that the reading public is kept informed concerning the industry's activities and conditions.

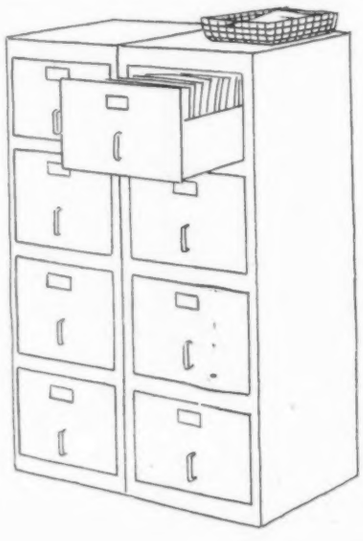
Last autumn the institute, through its publicity division, began issuing an unpretentious publication under the title *Steel Facts*, of which six numbers have appeared so far. That publication was not intended to have any regular date of appearance, but was started with the idea of having a recognized vehicle, free from the flavor of propaganda, for presenting to the public simple facts relating to the industry at such times as it might appear that enough items of current interest were in hand to warrant its publication. The first issue, printed in October, 1934, was sent to a mailing list which included members of the industry, principal newspapers, prominent men in public office, and various other persons who seemed likely to be of a sort interested in such matters. The total circulation of that issue was under 10,000 copies. The results so far apparent have been most gratifying; many of the items printed are widely quoted; the regular mailing list now approximates 35,000; copies of some of the issues have been purchased by various members of the industry for distribution among groups of individuals who might be interested therein, with the result that a high point was reached with the April issue, which had an aggregate circulation of more than 350,000 copies.

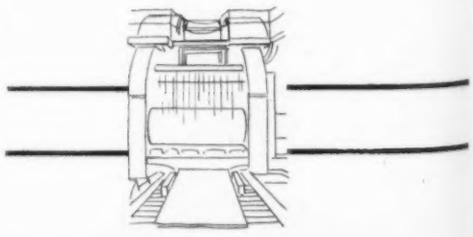
The publicity division also is constantly active in preparing news releases for use by the press and in cooperating freely with newspaper reporters and other writers, supplying whatever factual information may be available for their use in the preparation of special articles on which they may be at work. Literally thousands of items based on facts released by the institute have been printed by the newspapers of the country during the last year, dealing with industry matters of interest to every intelligent reader. There are, therefore, many evidences that through this new activity the institute is helping to create a vastly better understanding of the problems and basic conditions relating to the industry which it tries to serve.

### Code Staff Increased

Turning now to the activities of the institute which relate to code operation and administration, I believe you will recall the report on "The Operation of the Steel Code" made to you at the general meeting a year ago, in which it was pointed out that a very considerable amount of routine work had been imposed on the staff of the institute in connection with the operation and administration of the code. There has been relatively little important change in the character of those routine activities since that time. The staff then numbered 62. It now numbers 80, practically all the increase being in the enforcement division. The rest of the staff remains, with few changes in personnel, the same loyal and zealous group that it was a year ago.

Filing of lists of base prices at the beginning of each calendar quarter still presents a concen-





trated volume of work in a brief interval, which taxes the organization to its utmost. This may be judged from the fact that at the beginning of the current quarter, more than 35,000 notices of base prices filed were sent to members of the code in the course of two weeks. The problem of dealing with jobber agreements is indicated by the increase from some 7500 a year ago to more than 12,500 now. It should be noted, of course, that the same concern may appear as a jobber under several of the various sets of jobber regulations. Agency agreements which have had to be considered, often with many letters relating to one agreement, number more than 1500. These and other routine details of administrative activity have been somewhat less difficult in recent months than was the case a year ago when members of the code were still in the process of becoming fully adjusted to code provisions, but there has nevertheless been relatively little diminution in the daily volume of details of various sorts which have had to be handled by the staff of the institute. For example, the total of incoming and outgoing pieces of mail still averages close to 1000 per day.

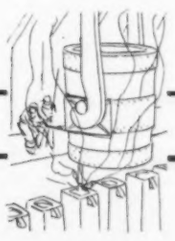
But as samples of what your institute staff can do, I should like to note that it has handled as many as 14,000 outgoing pieces of mail in one day; immediately following the amendment of the code a year ago, it sorted and shipped more than 100,000 copies of resolutions and regulations within 24 hr.; it has distributed at one time to members of the code more than 1,500,000 revised sheets of the List of Uniform Extras. I cannot praise too highly the willingness and loyalty of the institute staff.

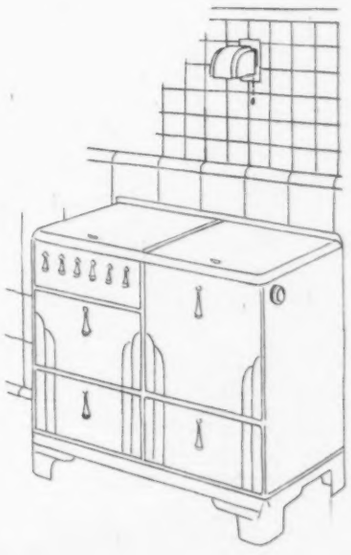
There has been approximately a year of experience under the code, as amended at the meeting of members on May 29, 1934. Up to that time there had been adopted 59 commercial resolutions and three sets of regulations. In the process of amending the code, the provisions of various commercial resolutions were incorporated in the code itself. Of the other commercial resolutions, some had expired by limitation, some had been rescinded and others were combined or incorporated in regulations. As a result, immediately after the amended code became effective, there were in effect only 29 commercial resolutions and four sets of regulations. During the 11 months which have elapsed, many amendments of those resolutions have been required, and it has been necessary to add new commercial resolutions until they now number 43, of which one is no longer in effect and five have been incorporated in regulations. The necessity of providing for various changes in the regulations, especially those relating to jobbers, has increased the number of sets of regulations to nine. Such additions and changes in resolutions and regulations reflect to a large degree the mental agility of members of the code and the constant play of their competitive forces.

"A YEAR of experience under the amended code indicates that it has been a remarkably effective instrument for eliminating unfair practices in the industry."

* * *

"In spite of the fact that a good many investigations have revealed violations of the code by members, or violations of their agreements by jobbers, the number is relatively insignificant when compared with the multitude of transactions or the volume of business carried on under the code."





### Code Without Rival in Effectiveness

The task of the board of directors and the work of the general administrative committee in helping the board with the details of code administration have been heavy and time-consuming. Regular meetings have been held at least monthly by both the board and the administrative committee, and various additional meetings have been required in order to deal with special matters which could not wait. With two exceptions, the membership of the board remains as it was a year ago, and membership of the general administrative committee is unchanged. There has been, therefore, the very real advantage of continued experience in the administrative body. Too much credit cannot be accorded the board and the administrative committee, collectively and individually, for the amount of time and unselfish devotion which they have given to their exacting duties and for the success which has marked their work of code administration. Indeed, if reports which come to our ears are to be credited, your code, in the effectiveness of its administration, is without a rival among the hundreds of attempts at cooperative self-government of an industry.

The work of other important committees such as the committee on commercial matters, the traffic committee, the technical committee, the committee on labor and the statistical committee has, in each case, imposed considerable burdens on their members and demanded much time for which the only reward has been such satisfactions as might come from the feeling that a service was being rendered for the benefit of the industry as a whole. Fortunately, very few changes have been necessary in the membership of these committees during the year.

Members of the commercial committee have given at least two days every month to the problems which

it had to study and on which it was expected to make recommendations for consideration by the board. Through various special subcommittees which have been named from time to time to explore some particularly difficult problem, many members of the commercial committee have given much more than two days per month in the interest of code matters. On the whole, it probably is true that the commercial committee has had a harder task during the last year than it had during the first eight months of operation of the code, although in the matter of proposed legislation recommended by the committee to the board for its consideration there is substantially less to show.

### Extras Clarified and Simplified

The commercial committee has been ably supported at all times by the technical committee and by the traffic committee. The technical committee has been especially helpful in its work on problems relating to uniform extras and deductions. In that field the progress made toward clarification and simplification has been one of the outstanding accomplishments of the year. It is, however, only fair to say that the list of extras and deductions as it appears in print, does not in any way reveal to the casual observer the tremendous amount of careful work required to provide the basis on which the system of extras is now built so soundly.

The work of the traffic committee in the compilation and publication of freight tariffs has been carried forward, with the result that there are now two additional freight tariffs, making four in all, including the important one covering Southern territory. That committee has been indispensable in helping to work out the provisions of certain regulations which have been prescribed by the board, particularly in connection with the troublesome problems relating to products for identified structures and the privilege of fabrication in transit. Another outstanding service rendered by the traffic committee has been in connection with the recent action of the Interstate Commerce Commission in authorizing a 7 per cent increase in freight rates. That action produced in many cases freight rates expressed in fractions extending to four decimal places. As a result of persistent efforts by the traffic committee, the carriers were authorized to and finally agreed to eliminate the bothersome fractions by making the increases applicable in the case of iron and steel articles solely on the basis of ½c., 1c., 1½c., and 2c., respectively. Thus every producer, big or small, was freed from a burden of clerical work and the strong likelihood of errors in calculation of delivered prices. It is another illustration of what may be done when the institute, through one of its committees, is able to act for the whole industry.

### Compliance With Labor Provisions Almost 100 Per Cent

The labor committee, continuing its work in connection with the labor provisions of the code, has done a thorough and effective job in helping members generally to adjust their individual activities to the provisions of the code in respect to hours of employment. Most careful scrutiny has been given every month by that committee to the reports submitted by members of the code, and especially to all cases where it appeared that a member might need advice or suggestions with respect to keeping hours of employment well within the provisions of the code. The committee has been active both as a committee and through its representatives working in the field in cooperation with the enforcement division, a fact which probably has been largely responsible for the almost complete absence of complaints about failure to comply with the labor provisions of the code.

I have already referred to the help from the statistical committee in connection with revision of the directory. But that committee has also had its share of work in other lines, in spite of its wise foresight in recommending, at the outset, a series of reports and statistical forms which have not needed revision. Considerable demands have been made on that committee on account of various requests for special tabulations of data, including those from an organization which is making an exhaustive study of the steel code.

In reality, therefore, the institute, in its activities relating to administration and operation of the code, has been able to call on the collective abilities and experience of four score men, representing every branch of the industry. It would not be possible, nor if it were possible would it be desirable, to try to create a permanent staff for code administration designed to supplant the various groups drawn as occasion requires from the ranks of the industry itself.

### Enforcement Work Increases

The work of the enforcement divison has increased, both actually and relatively, during the last year far more than that of any of the other activities in connection with code operation and administration. When I made my report to you a year ago, there were then only six employees whose work was concerned mainly with problems of enforcement, and two of them were working with and for the labor committee exclusively on matters concerning the labor provisions of the code. There are now in the enforcement division 21 men, of whom 10 are constantly at work in the field, and three others spend part of the time there investigating complaints of alleged violations of the code or resolutions or regulations thereunder. Exclusive of questions relating to the ability of concerns to qualify as jobbers, the number of complaints

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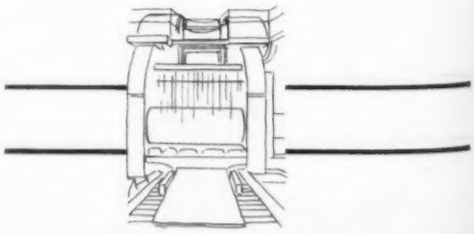


J. C. WHETZEL is a graduate of Washington and Lee University, and holds a postgraduate degree from Massachusetts Institute of Technology. His first business affiliation was as chemical engineer with Security Cement & Lime Co., and during the war years he served as first lieutenant in the chemical warfare service. After the war he became chemical engineer for E. I. duPont de Nemours & Co., and later joined the research staff of American Sheet & Tin Plate Co. From 1922 to 1932 he was manager of the laboratory, and since 1932 he has been assistant to the vice-president.

# Modern Steels and Weight Reduction*

° ° °

By J. C. WHETZEL

° ° °

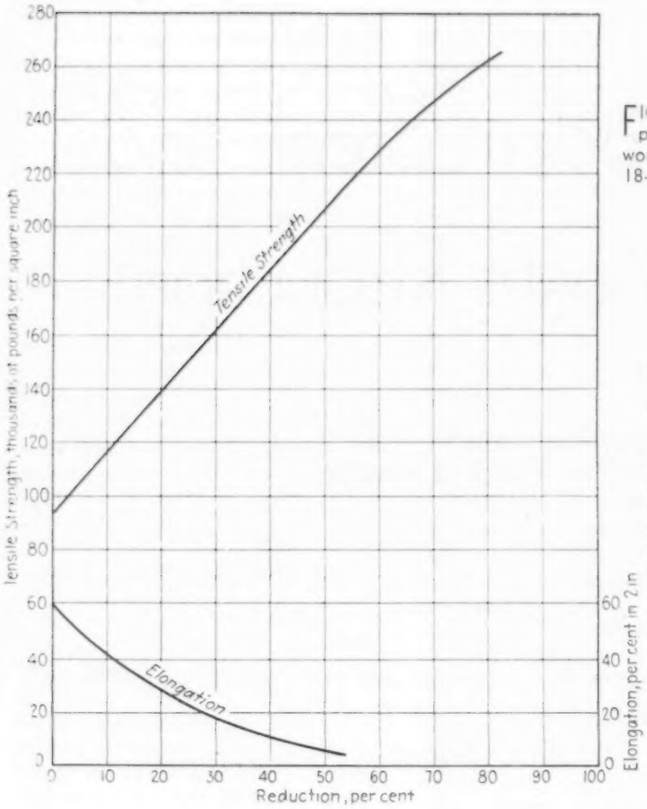
*Discussion by W. Robert Shimer, Bethlehem Steel Co., Bethlehem, and E. J. W. Ragsdale, E. G. Budd Mfg. Co., Philadelphia*

IN this iron and steel age, we have thus far been through a period in which things were made better by making them heavier. Steel gave tremendous advantages over wood and other materials of construction but often with an attendant increase in weight. Lighter metals have, in recent years, been offered as a means of securing the advantage of weight reduction, thus in some fields they stand as a challenge to the steel industry to utilize the best knowledge of steel metallurgy and improved design. If we are to use our iron ore, blast furnaces and steel mills to serve in full measure the present trend toward lighter and better structures, thus continuing the age of steel, we must meet the new requirements with stronger and more suitable steels. Lightweight construction is an activity of the greatest interest at present. Economic and other considerations require lightweight equipment for many applications.

Weight saving may be accomplished with a material of less density or with one that is stronger. It is not yet clear that a given weight of iron or steel can be expanded in the steel mill so that its density is less. It has been apparent that stronger steels with other desirable properties may be produced. Stronger steels permit the designer to save weight by reducing the size and changing the distribution of the members, thus in effect expanding a smaller weight of a stronger steel. In doing this, new designs must be created. More forming is generally necessary in the fabricating plant. Lighter shapes must be supplied by the rolling mills or drawn from strip or sheet, the latter intimating that the strip mills may eventually gain tonnage at the expense of structural mills. Connections and joints in lightweight construction become more involved with more general resort to welding. Exposed or unprotected parts must have increased corrosion resistance or the life of the lighter sections may be too short.

Increased efficiency is not the only accomplishment possible with the use of high-strength steels.

* Paper read before the general meeting of the American Iron and Steel Institute, at New York, May 23.


Tensile Strength
Elongation
Tensile Strength, thousands of pounds per square inch
Elongation, per cent in 2 in
Reduction, per cent

AT LEFT

FIG. 1—Tensile properties of cold-worked high-strength 18-8 stainless steel.

o o o

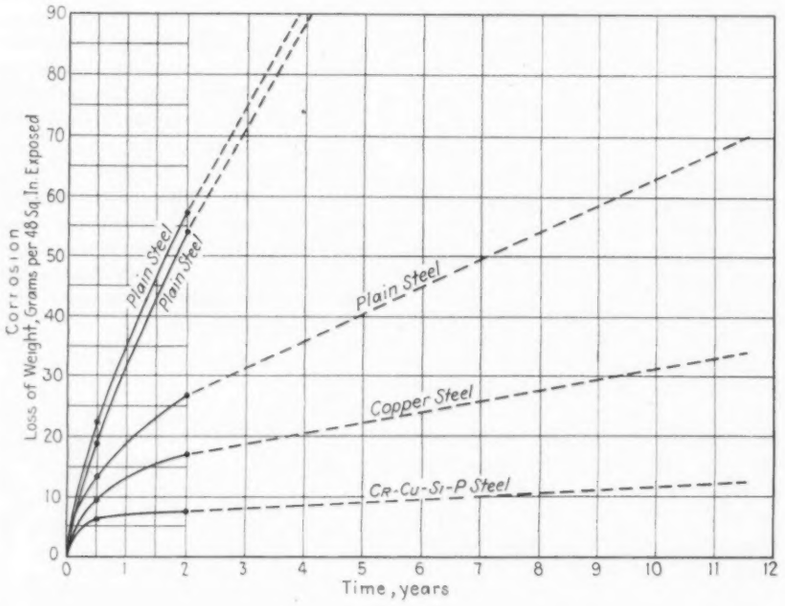
BELOW

FIG. 3—Showing the corrosion resistance of chromium-copper-silicon - phosphorus steel as compared with other steels. Test samples were annealed, pickled, and exposed on both sides to an industrial atmosphere. The extended lines, drawn straight, will become slightly parabolic as further data are obtained in all five cases.

New designs afford opportunity for the introduction of new and striking features. Prominent examples are in evidence in the construction of modern passenger carrying equipment whereby streamlining, greater passenger comfort, silent operation, decreased shock resistance by use of various cushioning devices, and articulated cars and trains are developed to a satisfactory degree. Other developments await the building of new equipment.

These preliminary thoughts permit the formulation of specifications for high - strength steels which may find general use. Steels have the advantages of a high modulus of elasticity — 28,000,000 to 30,000,000 lb. per sq. in., stability at high temperatures, good strength at very low temperatures, reliability under ordinary corrosive conditions and good performance under repeated stress, which fortunately make them more generally adaptable than many of the non-ferrous metals. Obviously, steels for weight reduction must have greater strength as ordinarily indicated by their tensile properties, especially a higher yield point or elastic limit, thus introducing the common term "high tensile" steels. Just as important, in fact frequently more so, are impact strength, showing resistance to sudden blows, and fatigue or endurance strength, representing the resistance to repeated stressing. The ductility must be sufficient for the required forming. Welding properties must be good. Atmospheric corrosion resistance and, in a few cases, resistance to other corrosive action must be high. In addition to all these requirements, the steel must also be available at a price which will make the completed structure a profitable and self-liquidating investment, or, in some instances, will not materially increase the cost of the completed structure.

Having indicated the general requirements for a modern weight-reducing steel, we may risk some generalizations upon the detailed properties and the possibilities offered by the accumulated knowledge of metallurgists. There is one remarkable steel, the 18 per cent chromium-8 per cent nickel austenitic stainless steel which, after cold working, affords such high strength combined with ductility that it is outstanding in its field. If this steel could be produced for a few cents a pound, the weight reduction problem would not be so complex. For the utmost in weight reduction, especially in certain rapid transit fields and in aircraft, it stands as a model of excellence. The large and important sphere of usefulness of this steel, however, is limited to some extent by its cost, but the resulting cost of a structure may prove economical when all factors are considered. Since metallurgy, engineering and economics combine to dictate a differentiation of cases, this material does not represent the solution of all problems. A case in point is the freight car. In considering steels for such equipment and for various other applications, a wide range of possibilities must be reviewed.



Before considering the physical properties desired for general lightweight construction, the extraordinary properties of the cold-worked 18-8 austenitic steel should be indicated. Tensile strengths of 150,000 lb. per sq. in. or more may be obtained by cold working the 18-8 steel and at the same time a tensile ductility may be maintained of not less than 20 per cent. This is a stainless steel and will last for centuries. It may be adjusted to any desired strength by varying the amount of cold work. The cost of fabricating very light sections in some forms of construction is frequently high, but the resulting cost of a structure may conceivably prove economical when all factors are considered. Connections are more difficult, especially if very light and fairly heavy sections must be joined. The variation in tensile properties of 18-8 strip produced by various percentages of cold reduction may be noted in Fig. 1.

The economic balance for numerous weight-saving applications involving large tonnages may be met by a steel of the following minimum physical requirements:

| | |
|---|---|
| Tensile Properties: | |
| Yield Point, lb. per sq. in. | 50,000 |
| Tensile Strength, lb. per sq. in. | 65,000 |
| Elongation, per cent in 2 in. | 22 |
| Impact, Izod, ft.-lb. | 40 |
| Endurance Limit, lb. per sq. in. | 40,000 |

With the wide range of steels available, it is risky to generalize upon the properties representing the best economic balance. It is also clear that these or any other properties will not remain the best for a long period of years. This is encouraging for the steel industry, suggesting that a few decades from now it will be necessary to rebuild again on the basis of the better and more economical steels which will have been developed in the meantime by the metallurgists. The manner in which the demand for low-alloy strong steels for lightweight construction has been met may be noted in Tables I to IV. The tabulations cover these steels in general and specific steels insofar as their properties have been made known.

The 18 per cent chromium and 8 per cent nickel stainless steel is outstanding with respect to corrosion resistance. Atmospheric corrosion tests extending over a long period of years indicate that this steel, if properly treated, will not corrode appreciably for many centuries.

The lower cost applications demand a steel which will afford approximately the same life for lightweight construction as for the conventional heavier construction. It appears that a steel for lightweight construction must resist atmospheric corrosion at least four times as well as plain steel. Steels having such corrosion resistance may be used with confidence that the lightweight structure will resist the elements equally as well as, if not better than, a much heavier structure built of plain steel.

In evaluating the corrosion resistance of steels it is essential that they be exposed under conditions as nearly identical as possible to those encountered in service. It is not possible to change the conditions of exposure in the interest of accelerating the test without the possibility of changing the entire trend of results. It is unfortunate that this is the case, as many years are required under normal atmospheric exposure to determine the corrosion resistance of a steel under such conditions. The number of possible alloy steel combinations is enormous, but fundamental and economic considerations furnish practical limitations. Large scale atmospheric corrosion tests in progress are illustrated in Fig. 2.

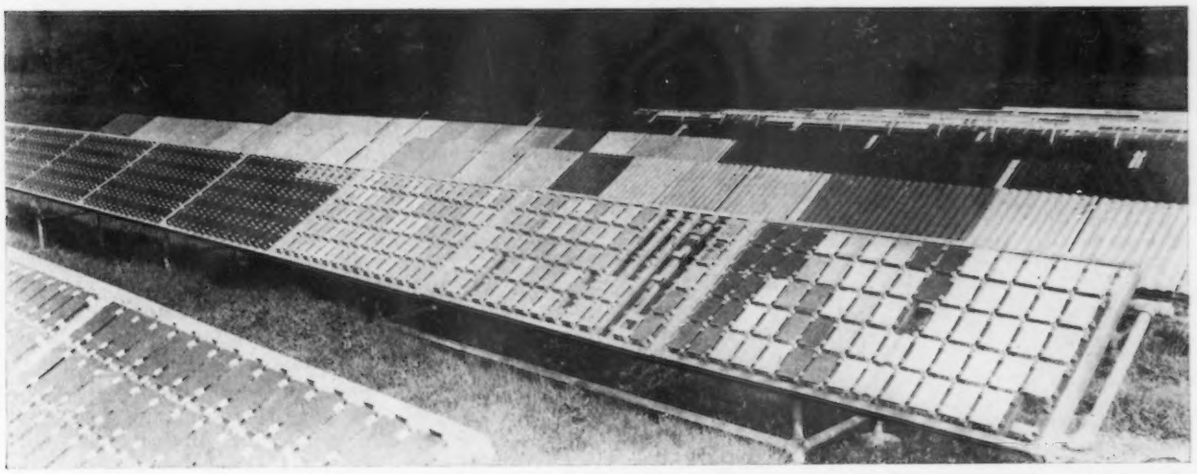


Fig. 2—Atmospheric corrosion tests on a large scale.

Evidence is available in the files of the American Society for Testing Materials, and elsewhere, demonstrating the increased corrosion resistance of copper-bearing iron and steel in the atmosphere with an average life of two to three times that of plain mild steel. Evidence has also been presented upon the superior corrosion resistance of chromium-copper-silicon-phosphorus steels. The latter material will give an atmospheric life four to six times that of good mild steel. The results of exposure of a steel of this type to an industrial atmosphere for several years are expressed graphically in Fig. 3. This evidence establishes even more resistance for this steel than for certain plain irons and steels in wide use. A photograph of typical specimens of plain steel, copper steel and the more resistant steel is presented as Fig. 4. The oxide of the chromium-copper-silicon-phosphorus steel is dense, hard and unusually resistant. Molybdenum and nickel in some steels may also give added corrosion resistance, the former especially under strongly acid conditions.

**TABLE I**

**General Range of Elements in Modern Low Alloy Steels for Weight Reduction**

| | Per Cent |
|---|---|
| Carbon | 0.10 to 0.40 |
| Manganese | 0.20 to 1.70 |
| Phosphorus | 0.01 to 0.20 |
| Sulfur | 0.05 max. |
| Silicon | 0.00 to 1.00 |
| Copper | 0.01 to 1.40 |
| Nickel | 0.00 to 3.50 |
| Chromium | 0.00 to 12.00 |
| Molybdenum | 0.00 to 0.40 |
| Vanadium | 0.00 to 0.20 |

**TABLE II**

**Manganese and Structural Silicon or Silico-Manganese High Strength Steels for Weight Reduction**

| | Medium or Intermediate Manganese, Per Cent | Structural Silicon, Per Cent |
|---|---|---|
| **Chemical Composition:** | | |
| Carbon | 0.15 to 0.35 | 0.20 to 0.40 |
| Manganese | 0.90 to 1.70 | 0.40 to 0.80 |
| Phosphorus | 0.04 max. | 0.04 max. |
| Sulfur | 0.05 max. | 0.05 max. |
| Silicon | 0.10 to 0.30 | 0.20 min. |
| Copper | 0.01 to 0.25 | 0.01 to 0.25 |
| Molybdenum | 0.00 to 0.40 | ..... |
| Vanadium | 0.00 to 0.20 | ..... |
| **Minimum Physical Properties:** | | |
| Yield Point, lb. per sq. in. | 55,000 | 45,000 |
| Tensile Strength, lb. per sq. in. | 90,000 | 90,000 |
| Elongation, per cent in 2 in. | 20 | 18 |
| Impact, Izod, ft.-lb. | 40 | ..... |
| Endurance Limit, lb. per sq. in. | 40,000 | ..... |

The effects of specific elements upon the properties of steel are fairly well known, and it is possible to generalize upon additions which might be made to obtain desired properties. However, the combined effects of the various elements are less clear, especially when several are utilized in the same steel. In the latter case there is nothing to take the place of making the steels and determining the actual properties by an extensive testing program. An element in combination with one or more other elements will frequently show properties decidedly at variance with the properties exhibited by the single element in steel.

Carbon has been the element commonly used for a very long time to obtain hardness and strength. By suitable treatment of the higher carbon steels a wide range of strength, including very high strength, is available. Manganese and silicon are other common elements in steel which alone or in combination may be used to obtain greater strength. Molybdenum and vanadium have also been added to the manganese steels. In the plain carbon, manganese and silicon steels, it is difficult to obtain the ductility required in fabricating for many weight-reducing applications and in some instances impact strength is not as high as might be desired. Carbon, manganese and silicon are elements which, under most conditions, and in the proportions in question, do not tend to increase the corrosion resistance of steel.

Chromium is a most useful element in imparting strength and corrosion resistance. If used to the extent of about 12 per cent or more in the right proportion with carbon, it affords the stainless and heat-resisting series of steels. The plain chromium-carbon steels are possibilities. In the absence of other elements combining to give corrosion resistance, it is necessary to use chromium to the extent of about 12 per cent, thus placing it in the stainless class and also making it an expensive steel, which may not meet the economic requirements.

Copper is very useful in imparting corrosion resistance to steel and may increase the strength slightly. In combination with phosphorus, corrosion resistance is accentuated, and by the proper balancing of other elements the effect of phosphorus upon the physical properties is altered materially. Copper in combination with chromium has been utilized abroad in high-strength high-carbon steels for some time, but without the claim of additional corrosion resistance. Copper and chromium in

**TABLE III**

**Low-Chromium Alloy Steels for Weight Reduction**

| Chemical Composition in Per Cent: | Chromium | Chromium Copper | Chromium Copper Silicon Phosphorus | Chromium Copper Silicon Nickel | Chromium Manganese Silicon | Chromium Vanadium |
|---|---|---|---|---|---|---|
| Carbon | 0.05 to 0.15 | 0.30 max. | 0.10 | 0.15 | 0.20 to 0.30 | 0.15 to 0.25 |
| Manganese | 0.30 to 0.50 | 0.70 to 1.00 | 0.10 to 0.30 | 0.55 to 0.75 | 0.90 to 1.50 | 0.50 to 0.80 |
| Phosphorus | 0.03 max. | 0.05 max. | 0.10 to 0.20 | 0.05 max. | 0.04 max. | 0.04 max. |
| Sulfur | 0.05 max. | 0.05 max. | 0.05 max. | 0.05 max. | 0.05 max. | 0.05 max. |
| Silicon | 0.25 | 0.20 max. | 0.50 to 1.00 | 0.00 to 0.45 | 0.60 to 0.95 | .... |
| Copper | .... | 0.25 to 0.50 | 0.30 to 0.50 | 0.01 to 0.50 | .... | .... |
| Nickel | .... | .... | .... | 0.25 to 0.45 | .... | .... |
| Chromium | 5.00 to 12.00 | 0.70 to 1.10 | 0.50 to 1.50 | 0.05 to 0.90 | 0.30 to 0.70 | 0.80 to 1.10 |
| Molybdenum | .... | .... | .... | Present | .... | .... |
| Vanadium | .... | .... | .... | .... | .... | 0.10 to 0.20 |
| **Physical Properties:** | | | | | | |
| Yield Point, lb. per sq. in | 35 to 100,000 | 46,000 | 50 to 60,000 | 70 to 80,000 | 60 to 70,000 | 55 to 80,000 |
| Tensile Strength, lb. per sq. in. | 65 to 125,000 | 74 to 85,000 | 65 to 75,000 | 80 to 90,000 | 85 to 95,000 | 85 to 100,000 |
| Elongation, per cent in 2 in. | 35 to 20 | 17 | 27 to 22 | 25 to 14 | 25 to 20 | 20 to 15 |
| Impact, Izod, ft.-lb. | 80 | .... | 60 | .... | 32 | .... |
| Endurance Limit, lb. per sq. in. | .... | .... | 45,000 | .... | 45 to 50,000 | .... |

**TABLE IV**

**Copper, Nickel and Vanadium Low-Alloy Steels for Weight Reduction**

| Chemical Composition in Per Cent: | Copper Nickel | Copper Nickel Molybdenum | Nickel | Vanadium |
|---|---|---|---|---|
| Carbon | 0.05 to 0.20 | 0.05 to 0.25 | 0.05 to 0.35 | 0.10 to 0.30 |
| Manganese | 0.20 to 0.70 | 0.40 to 0.70 | 0.40 to 1.00 | 0.40 to 0.80 |
| Phosphorus | .... | 0.04 max. | 0.05 max. | .... |
| Sulfur | .... | .... | 0.05 max. | .... |
| Silicon | .... | .... | 0.30 | .... |
| Copper | 0.35 to 1.00 | 0.40 to 1.40 | 2.00 | .... |
| Nickel | 0.75 to 2.00 | 0.20 to 0.75 | 2.00 to 3.50 | .... |
| Chromium | .... | .... | .... | .... |
| Molybdenum | .... | 0.10 to 0.15 | .... | .... |
| Vanadium | .... | .... | .... | 0.10 to 0.20 |
| **Physical Properties:** | | | | |
| Yield Point, lb. per sq. in. | 40 to 75,000 | 60 to 70,000 | 50 to 60,000 | 40 to 50,000 |
| Tensile Strength, lb. per sq. in. | 55 to 90,000 | 75 to 90,000 | 85 to 100,000 | 65 to 75,000 |
| Elongation, per cent in 2 in. | 35 to 30 | 25 to 18 | 25 to 20 | 30 to 20 |
| Impact, Izod, ft.-lb. | .... | .... | 40 to 60 | .... |
| Endurance Limit, lb. per sq. in. | .... | .... | .... | .... |

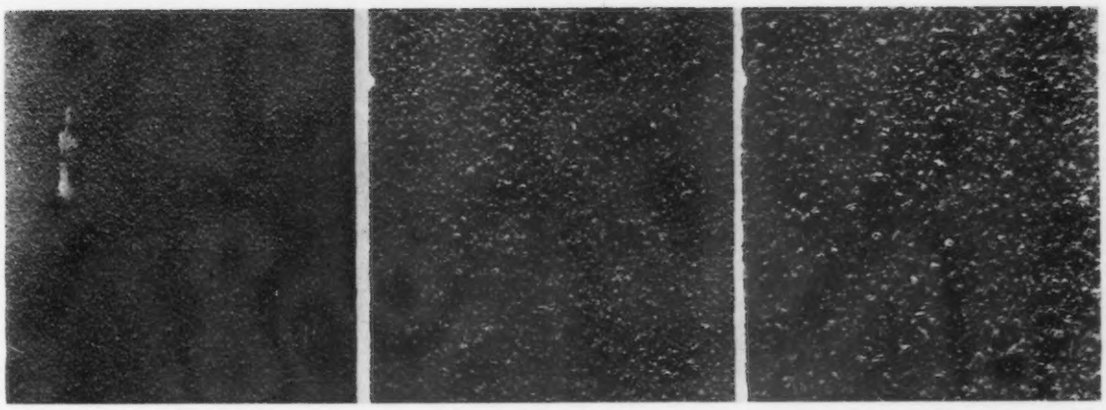


FIG. 4—Surface condition of three different types of steel after exposure to an industrial atmosphere for three years. The steels are chromium-copper-silicon-phosphorus, copper bearing, and plain steel, from left to right, respectively.

proper combination with phosphorus, silicon and other elements afford a superior corrosion resisting steel. Phosphorus in such combinations does not introduce undesirable "cold shortness." Low-alloy steels of this type have high strength, adequate ductility and good welding properties.

Nickel has commonly been added to steel for many years for higher strength. The 3.5 per cent nickel steel was used in bridges many years ago. In combination with chromium and carbon in the proper proportions, nickel gives the extremely useful austenitic 18-8 stainless steel already mentioned as having maximum strength and ductility after cold working.

The economics of alloy additions must always be considered. Many large weight-saving applications may not prove economical if the price of the steel is too high. Vanadium, tungsten, molybdenum, cobalt, nickel, chromium and zirconium are the more expensive common alloying elements. These and many other elements are being used in the low-alloy steels. The required proportion of alloy must be considered in calculating costs.

While it is difficult to generalize when there are so many possible combinations of elements, we have indicated in Table I the general range of elements which have been covered in the modern low-alloy high-strength or high-tensile steels. In Tables II, III and IV the common high-strength steels are classified according to conventional practice, and in the case of the more recently developed steels, according to the important alloy additions. The properties of all these steels may be altered materially by varying the carbon content with appropriate heat treatment. Increased carbon with suitable treatment confers added strength, but at the same time decreases ductility and corrosion resistance. It is necessary to establish proper balance between the desired properties and the results required in fabrication and service.

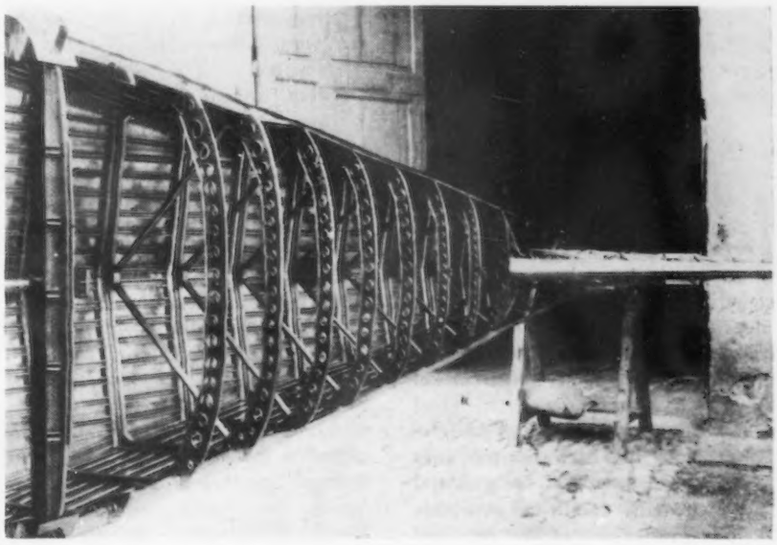


FIG. 5—Stainless 18-8 steel used in aircraft construction.

The medium manganese and structural silicon steels covered by Table II are high-strength steels which have been used for a long time, especially in bridge construction. They are useful low cost and strong steels for weight reduction. They have excellent strength, but lack the greater ductility of other low-alloy steels. They have, roughly, the corrosion resistance of ordinary steel or of copper-bearing steel if this element is added. Certain copper-manganese steels were brought forth in Germany some years ago. Molybdenum or vanadium may be added to the manganese steels to gain certain advantages as indicated also in Table II.

Selecting the alloying element chromium as a means for classifying a very important group of high-strength steels, Table III has been prepared. While chromium is an important addition, other elements such as copper, manganese, silicon, phosphorus and nickel may be fully as important. A large number of combinations may be obtained for these complex low-alloy steels with the elements available. Many have good ductility, considering their strength, and some, especially the chromium-copper-silicon-phosphorus steel, have excellent corrosion resistance. These special chromium alloy steels include the following combinations of alloying elements:

(1) Chromium.
(2) Chromium-copper.
(3) Chromium - copper - silicon-phosphorus.
(4) Chromium - copper - silicon-nickel.
(5) Chromium - manganese - silicon.
(6) Chromium-vanadium.

Additional high-strength steels have been developed which do not contain chromium as an alloying element. Copper and nickel with smaller amounts of molybdenum are the important constituents. These steels, including the plain nickel and vanadium steels, are covered by Table IV. The following combinations are indicated:

(1) Copper-nickel.
(2) Copper-nickel-molybdenum.
(3) Copper-molybdenum.
(4) Nickel.
(5) Vanadium.

### Use in Aircraft

The ultimate in weight reduction is essential for steel aircraft construction. While the high-chromium steels have been applied to some extent especially abroad, the ideal material is the cold-reduced high tensile strength 18 per cent chromium and 8 per cent nickel steel. The advantages of this steel for aircraft are manifold, and its application has been limited only by the development of designs and the steel mill facilities available for the production of the required gages and widths. Structures can be built as light with this stainless steel as with other materials, and where the unit stresses are high, the advantage is materially in its favor. Its high modulus of elasticity, its remarkable corrosion resistance, the possibility of shot or spot welding, and its high endurance limit are all important advantages.

Aircraft parts constructed of stainless steel are illustrated below in Fig. 5.

### Use in Rapid Transit

For some years there has been a growing recognition of a need for better and more efficient equipment in the rapid transit field, and now new developments, based upon strong lightweight construction, are bearing fruit. One of the earliest steps in this direction involved the use of medium manganese side plates in subway cars of the New York Rapid Transit Company. An outstanding recent example is the modern street car which has been developed as the result of a far-reaching research activity carried on by the Electric Railway Presidents' Conference Committee. The specifications adopted by the Conference Committee require the use of a high-strength steel and, accordingly, a specimen car was constructed of a steel of this character. In addition to weight reduction, the car embodies many novel ideas, including a pleasing streamlined appearance, rapid acceleration and deceleration, passenger comfort and silent operation.

The exceptional weight reduction possibilities of the 18-8 stainless steel make this type of material very promising in rapid transit car and train construction. Elevated lines having structures incapable of supporting heavy trains of ordinary steel are a promising field for modern lightweight construction involving new steels. An example is the stainless steel train which was constructed for operation on the Brooklyn-Manhattan Transit elevated lines.

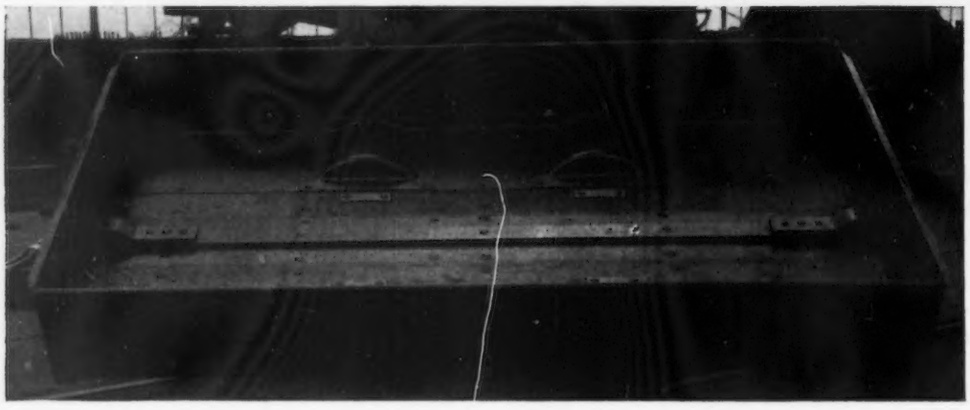
### Uses in Buses and Trucks

Passenger buses must be as light as possible not only for efficient operation, but to conform with various state regulations. Light-metal alloys have found application in this form of construction. This should be an attractive field for 18-8 stainless steel because of the extreme lightness requirements. Much can also be accomplished in this field with the lower alloy steels used in proper designs.

For trucks of various types, especially tank trucks and trailers, the low-alloy steels are finding wide application. An example of

AT RIGHT

FIG. 7—Chromium-copper - silicon - phosphorus steel welded tank which did not leak after the severe mechanical treatment shown here.



AT LEFT

FIG. 6—Chromium-copper - silicon - phosphorus steel and medium manganese steel were used in the construction of this all-steel mine car.

FIG. 8—Chromium-copper-silicon-phosphorus hopper car under construction.

this is the reduction in thickness of the sheets for tank trucks as follows:

Mild steel—heads gage, 10 to 11; shells gage, 12 to 14; weight reduction, —.

High tensile steel—heads gage, 12 to 13; shells gage, 14 to 16; weight reduction, 25 to 30 per cent.

Thus important weight savings are possible without much additional cost.

In the automobile field, streamlining often increases the weight to such an extent that advantages in lessened wind resistance are lost. The answer to this problem is evidently the use of stronger steels of the low-alloy type in lighter gages. Body designs must be modified to avoid extreme deep-drawing requirements which cannot generally be met by the higher strength steels.

### Use in Railroad Equipment

The railroad equipment manufacturers are busily engaged in engineering studies and developments looking toward reduction in weight, streamlining and otherwise modernizing railway passenger equipment through the adoption of various types of high-strength steels, used singly and in combination. Under certain conditions, and as a means of effecting still greater efficiency and comfort combined with speed and safety, trains of this character are likely to supersede the familiar type of train now in use on American railroads, and the construction of many such trains is assured.

Pioneering in this field was first undertaken by the Edward G. Budd Mfg. Co. through the use of 18-8 stainless steel. Other equipment manufacturers have adopted high-strength low-alloy steels in somewhat different designs and using different means of fabrication to produce trains of this new, modern type. Other trains are being built of these and other steels. Luxurious lightweight passenger coaches are being constructed of low-alloy steel.

Freight cars offer the greatest opportunity for weight reduction, and the one economically most significant. The replacement of dead load with pay load is a profitable and self-liquidating proposition. For this application the relatively low cost low-alloy steels are indicated. Corrosion resistance is an important requirement if the investment is to be liquidated before rebuilding is necessary. During the last two years much progress has been made in the weight reduction of freight cars. Another notable development is a hopper car constructed of such low-alloy steels.

For car rebuilding and other programs, the car parts manufacturers are supplying paneled and corrugated sides and ends, floor sheets, hopper doors and roofs fabricated of high-strength steel.

Substantially all car building companies, car accessory manufacturers and railroads are engaged in studies to determine the most economical dead load weight and have contributed much to the weight reduction problem, by giving effect to many applications not mentioned specifically in this paper. This development should afford much tonnage to the steel industry over a period of years and is very gratifying in view of the continued drop in freight and, to a less extent, passenger car construction over the last 20 or 30 years.

### For Building Construction

For factory and mill construction, a general reduction in weight

of equipment, such as cranes, which must be supported by the structural members, offers opportunity for savings. Dead weight in roofs, trusses and other members can be reduced with economy. The increased corrosion resistance of some of the lower-alloy high-strength steels is an attractive feature on sheathing and roofing materials.

Efforts have been made to find stronger steels suitable for marine application that will permit ship construction developments, enabling the ship owner to operate more profitably. The low-alloy high-strength steels with more general use of welding offer means of weight saving for the main strength members of the hull and similar parts. Increased fire resistance is a strong argument for the use of steel in partitions. The stronger steels permit such construction without appreciable increase in weight. Stainless steel finds application for deck houses and parts subjected to severe corrosion.

## Other Applications

Many important applications for weight reduction have been mentioned, but large tonnages of the strong alloy steels might be used to advantage generally for machinery and industrial equipment including, especially, moving parts. In some instances increased resistance to abrasion and heat accompanies increased strength. This is not always the case, but the manganese steels and some of the low-chromium steels have given excellent service under abrasive conditions encountered in such applications as coal, ore and stone screens and chutes. Mine and other industrial cars are especially good prospects for high-strength or lightweight construction. A mine car constructed of one of the low-alloy steels is shown in Fig. 6. Excavating, especially drag-line equipment, is a likely weight reduction application. Centrifugal pumps and lines handling abrasive pulp in metallurgical plants are suitable applications for the abrasive and corrosion resisting steels.

## Design and Fabrication

The higher strength steels permit considerably higher working stresses over those allowable with the plain carbon or mild steels. In many cases a value of 25,000 lb. per sq. in. for combined stresses has been used in comparison with 16,000 lb. per sq. in. for regular carbon steel. On account of steel's higher modulus of elasticity, deflection may be very much less with it than with other metals for the same stress, thus affording more leeway for lightening structures without loss of rigidity. The reduction in the section modulus resulting in a greater deflection and less rigidity may be a limiting factor in reducing weight, but can generally be overcome by suitable design.

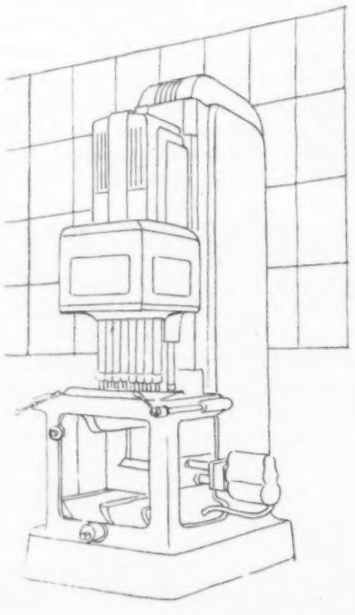
Details of design assume much more importance in applying stronger materials and decreasing weight. Conventional designs cannot always be followed. For example, it is difficult to obtain maximum weight saving in flat panels without corrugating, crimping or paneling the sheets or strips for the purpose of stiffening and avoiding distortion of the flat surface.

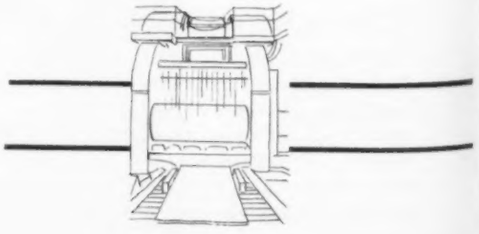
Some of the high-strength steels which have been developed may be formed cold or hot. The latter requires a non-air-hardening steel, if the formed part is to retain maximum resistance to failure in service. In many important applications, it is possible to form these steels cold by pressing or bending, especially if effort has been made to reduce the severity of the forming by decreasing depths of draw or increasing radii.

Lighter sections and lighter gage sheets and strip require more care in fabricating. In changing to thinner and lighter sections, these considerations should be kept in mind. Difficulties encountered with high-tensile steels are not always characteristic of the metal itself, but may be due to improper design or design beyond the limitations of decreased thickness. Spring-back in forming is slight in bends over small radii, but may be as much as 25 per cent over larger radii. The higher yield point requires greater force to produce deformation. However, the reduction in thickness usually reduces the press load so that extensive changes are not required in shop equipment. Slightly more power, possibly 25 per cent, is required in punching the low-alloy high-strength steels. Special equipment is not necessary in working many of the low-alloy high-strength steels, an important factor in their rapid application.

Rivets, in the smaller sizes for cold driving and the larger sizes for hot driving, are supplied in some of the high-strength steels. Such steels flow well, and the hole is tightly filled. It is essential that such steels are not "cold short." Slightly higher riveting temperatures are required for the low-alloy steels.

The low-alloy steels, especially the manganese and low-chromium steels, are welded readily by the usual methods and with the usual equipment. Air hardening and structural changes which weaken the metal must not be characteristic of the steel. Steels are available which meet these requirements. Welding technique, especially in spot welding, must be adapted to the steel and the design. Corrosion is generally not a factor in welded joints, but welding rod, coated and uncoated, is available for the more corrosion resisting steels in case special conditions require this precaution. The success with which low-alloy high-strength steels may be welded is indicated in Fig. 7, representing a welded tank which did not leak following hammer tests and re-





peated drops from considerable height after filling with water.

Lightweight design and construction are favored by the availability of some of the newer steels in shapes, plates, bars, strip, sheets, rods, wire products, pipe and tubular products. New American Railway Association Z-bar sections have been made available in light shapes for car construction and were used in the hopper car shown in Fig. 8. These assist in lowering labor and fabricating costs which are an important factor in weight reduction economics and may fix the limit for effective reduction. Fig. 8 also shows some of the details of a hopper car constructed of low-alloy high-strength steel. Changes in design are not only possible, but desirable in order to take advantage of the better physical properties of the steel.

In a program of weight reduction the greatest economies are effected where decreased weight permits an increase in load. Expressed popularly this represents an increase in "pay load" and a reduction in "dead load." The return upon weight reduction is largest where the proportion of dead load to live load is high and where transportation costs are high.

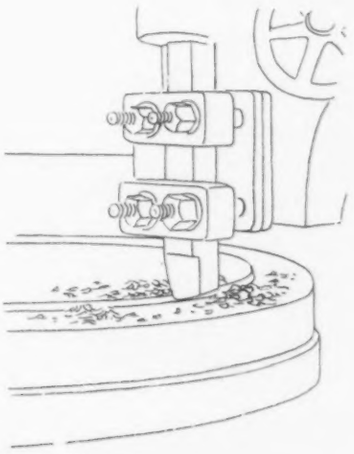
The most economical results require a consideration of first cost, maintenance, operating cost and depreciation. Decreased cost of operation accounts for the larger saving. This introduces strongly the factor of corrosion resistance in the selection of suitable steels for many applications, including the important one of freight cars.

Freight cars may be selected as a typical weight reduction application for further consideration. This is a large field for steel tonnage and also a promising one for the use of high-strength steels. The ratio of the freight car dead weight to the pay load has increased materially during the last decade or so. The advisability of weight reduction is favored by the increased speed of moving freight trains and by the competition of other means of transportation.

Lightweight open cars of the hopper type will show large savings, and, if properly designed and constructed of suitable high-strength steels, the investment in new cars will be self-liquidating. Box cars are seldom loaded to capacity. Savings with this type of car will result from a reduction in tare ton mileage.

It is difficult to compare the weights of the modern, high-speed, streamlined passenger equipment with that of the conventional type. However, such trains built of high-tensile steels show such substantial economies that a new era in equipment is generally recognized. The savings effected are very large and are due not only to the reduction in dead weight, but to revolutionary changes in motive power and operation. A comparison is made in the table of the large weight savings possible with passenger equipment constructed of high-strength steels and similar equipment constructed of plain steel. Under conditions most favorable to light construction, the operating savings effected through the adoption of modern rapid transit equipment repay the higher first cost of the better steels employed in little more than a year.

Comparisons of weight savings through the use of high-strength steels in freight equipment may be made readily by reference to Table V. These savings are so important and the resultant economies of operation appear so large that the consumption of steel for this type of equipment may well show a large increase for the first time in many years if suitable application of some of the high-strength steels is made.



Another application upon which evidence is available covers the replacement of mild steel by the high-strength steels in the gasoline and oil tanks for truck transportation. Substantial reductions in weight have been obtained.

The reduction in dead weight of cars is shown to be from 20 per cent to more than 40 per cent of the conventional weight. Because many of the applications have been of an experimental nature, in which full advantage may or may not have been taken of the properties of high-tensile steels, and because these designs will lead to further refinements, it is logical to believe that total reductions in weight of future high-tensile steel cars will approach and even exceed from 40 to 50 per cent.

The railroads and other organizations are intensively studying the use of lighter equipment. Careful calculations of the savings resulting from weight reduction are being made, especially in the important freight field. These savings are affected by many variables. The best information leads us to believe that lightweight freight cars constitute a self-liquidating capital investment securing the amortization of new and replaced cars on a reasonable basis. Much progress has been made in the design of these lightweight cars, and the car builders are prepared to undertake their construction. An extensive car building and rebuilding activity will do much to revive the lagging durable goods industry.

The steel industry should be the agent or the moving force to advance the weight-reduction program. The accomplishments of the modern high-strength steels point the way to a profitable policy for the steel industry as well as the railroads and other large consumers. By introducing new and better steels which better serve the various requirements, new uses will be developed and new tonnage acquired.

## Discussion

By E. J. W. RAGSDALE

*Chief Engineer, Railway Division, E. G. Budd Mfg. Co., Philadelphia*

IN attempting to cover a broad field, Mr. Whetzel has had to pass lightly over certain very per-

tinent points. I feel two of them to be worthy of special attention, namely, the questions of economic balance and corrosion resistance.

Economic balance, being a matter of simple arithmetic, is really very difficult of solution. It is so easy to omit some determining item. The base price of structural material is so definite and other considerations often so intangible that undue importance is apt to be given to material cost, rather than to material accomplishment. In the case of the Burlington Zephyr, the cost of the stainless steel amounted to only 8 per cent of the total train cost. This train is earning at the rate of 50 per cent per annum on the initial investment. Had low alloy steel been used instead of stainless, the immediate saving on material would have been about $15,000. The return would have been raised only 4 per cent, that is provided equal earnings could have been had despite a slower schedule, a less attractive train and a higher maintenance. In fact, if the Zephyr had been built of any metal other than stainless, and to an equal factor of safety, its performance would not have been such as to attract public attention. Public attention is only one of the many intangible items which can outweigh that of material cost. The economic balance is very pertinent but it is not to be lightly struck.

### Corrosion Attacks Joints First

Mr. Whetzel also supplies the interesting thought that corrosion resistance need only be increased to the extent that light-weight construction becomes more vulnerable to corrosive attack. He places the figure at about four. This would be perfectly logical were corrosive attack any respecter of figures. As a matter of fact, corrosion usually attacks the most vulnerable points of any exposed structure, namely, the joints, and, by the same token, these are the most difficult parts to cover with protective coating. The closed sections and complicated joints, almost inherent to light-weight construction, invite corrosive attack far beyond any increased resistance reported for these new alloyed steels. However, the improvement over mild steel in conventional construction is not only promised but will prove to be very real.

Just where the line is to be drawn between low alloy and stainless is no easy matter to predict, nor can it be, for the economic balance will have to be determined for each individual case. Both steels serve very useful purposes, but neither will serve as well if extended into either improper or extravagant usage.

The engineer today has to design with the slide rule in one hand and the cash register in the other. It becomes increasingly difficult to make both give the same answer at the same time.

## Discussion

By W. ROBERT SHIMER
*Metallurgical Engineer, Bethlehem Steel Co., Bethlehem, Pa.*

MR. WHETZEL'S paper covers in a thorough manner a subject of special interest at this time to the steel industry in particular, and to designers, engineers and car builders in general. Due to the wide gap in cost between copper-bearing steel and the truly stainless or rustless grades containing high chromium, or steel in the 18 per cent chrome, 8 per cent nickel class, many steel companies have been and are still conducting research to find a compromise-cost, rust-resisting steel and, if possible, a steel of higher physical properties than copper-bearing and standard structural steels. As a result of this research, there are a number of low-alloy steels now on the market being sold under various brand names to meet the demand of weight reduction and to increase the resistance to corrosion.

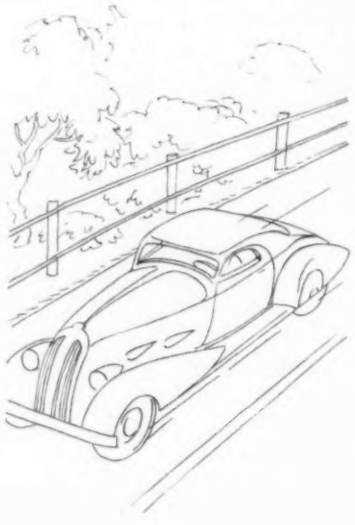
It is felt that the time-tested carbon structural grade has no economic rival for use in the vast majority of fabricated structures. This grade has behind it over a generation of satisfactory use. It is a perfectly weldable steel and readily fabricated by present equipment. Its specified strength has recently been slightly advanced (ultimate tensile strength of 60,000 to 72,000, and minimum yield point of 33,000 lb.). Its use in fabrications is now almost universal, and by reason of its simple composition and its manufacture in great tonnage it will always be the lowest cost and the most universal applicable structural grade.

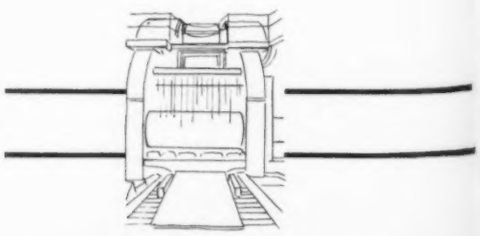
Special requirements that may call for a departure from the above grade (A.S.T.M. structural steel for bridges, A-7-34) can be grouped into three classes:

(A) Slightly modified strength-range, or slightly greater emphasis on some particular property in a carbon steel similar to A-7.
(B) Distinctly higher minimum strength.
(C) Proposed steels for resistance to corrosion.

Requirement (A) is typified, for instance, by A.S.T.M. A-113 steel for locomotives and cars, which calls for slightly reduced strength and emphasizes the property of cold bending; or by the several A.S.T.M. specifications for boiler steel. These special carbon steels are all well established in their particular fields and call for no comment here.

Requirement (B), a distinctly





higher minimum strength is met by structural silicon steel, A.S.T.M. specification A-94. By use of slightly increased manganese, a steel otherwise of the A-7 type is increased 40 per cent in strength (ultimate tensile strength of 80,000 to 95,000, and yield point of 45,000 lb.), its specified ductility decreasing in the same ratio as its strength increases. It has been used in the main trusses of practically every long-span bridge construction in the U. S. in the last 20 years and has a perfect record. Its premium is not too great to be economically employed, and general engineering practice is to use it wherever the ratio of dead to total load is great, and a saving of dead steel weight is of importance in total cost of carrying structure.

Requirement (C), proposing increased resistance to corrosion, is the topic of the hour and has resulted in the offering of a number of low alloys, proprietary and otherwise. These low alloys cost more than copper-bearing and also structural silicon steels, and their strength will average slightly less than the latter; they are, as a rule, tougher and more ductile than silicon steel. Their corrosion resistance permits of reducing minimum thickness to a point governed by strength or rigidity, while in ordinary structures a minimum thickness is set by the fear of corrosion loss.

Excess weight is a penalty, wherever that weight has to be hauled and energy has to be expended in hauling it. Therefore, it is in railway rolling stock, in auto trucks and other vehicles that such steels prove an economical investment for the use. Other analogous uses may develop with careful searching of the possible field, but the field of application is likely to prove quite limited.

In Mr. Whetzel's paper it is stated that certain of these low-alloy steels have an atmospheric life four to six times that of good mild steel. The actual life of such a steel depends upon the nature of the atmosphere where it is exposed. We know the corrosive effect along the seacoast in New England is less severe than along the Florida coast or at Galveston; also the clear, dry atmosphere in Arizona is less severe than in many industrial localities. It is very difficult to predict a definite ratio value of corrosion for these many variable conditions unless based on many long-time exposure tests under all conditions.

It has been our experience that high phosphorus steels have very low impact values at sub-zero temperatures and, even granting that phosphorus has a corrosion-resisting value, it might be safe to sacrifice some of the corrosion resistance credited to this element by reducing it rather than run into low temperature embrittlement. This feature has considerable significance in transportation where shock-loading is by no means an unimportant factor.

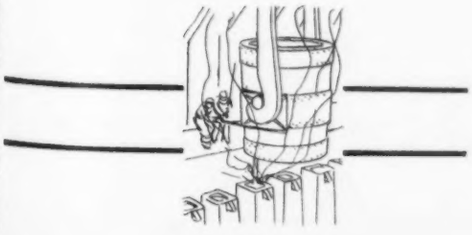
Mr. Whetzel makes the following important statement which cannot be overemphasized: "On account of steel's higher modulus of elasticity, deflection may be very much less with it than with other metals for the same stressing, thus affording more leeway for lightening structures without loss of rigidity." I am also informed by fabricators that steel works more easily than non-ferrous metals used in car construction particularly.

Where deflection rather than strength is a controlling factor, nothing is to be gained by using high-strength steel. If the advantage of increased strength is used to reduce size, deflection will increase; if size has to be kept constant or increased to meet deflection requirements, a low-strength steel will do the job just as well—always provided, of course, that stresses are kept within the elastic limit of the material.

For the low-alloy corrosion-resisting steel, I am glad to note that in most cases too high tensiles are not advocated. It is believed that even 80,000 lb. tensile may be too high as such a steel, no matter what its composition, will not take a deep draw and will give other fabricating difficulties. The higher tensile sheets or plates will also tend to buckle, and buckles are difficult to remove once they exist. Furthermore, when sufficient hardening elements are added to produce the higher tensile strengths there is a tendency to produce an air-hardening steel which in turn will not be a safe welding steel, unless stress-relieved. For sheets and plates particularly, 50,000 to 60,000 yield point and 65,000 to 75,000 lb. tensile strength should be sufficiently high for the corrosion-resisting grades, as this is accompanied by a yield point almost double that of standard structural grades.

Another limitation on high physical properties of steel for cold fabricating such as bending, forming, punching and shearing is that of present shop machinery. If the physical properties are too high it reduces the capacity of this machinery or the operators will have to resort to hot forming, or it might even result in the scrapping of fabricating machinery, particularly in the structural industry.

Weldability is an important factor when considering the higher tensile steels. With special technique most all the high-tensile steels can be welded, but the important consideration is the possibility of air-hardening tendencies in the welded zone which may reduce the impact or shock-resisting properties unless the completed structure is annealed for grain refinement. The welding engineers are fully aware of this condition and have planned a comprehensive program of investigation. As an example, in car construction it would be impracticable to heat treat for grain refinement and, therefore, places somewhat of a limitation on the amount of hardening elements the steel can contain, and these safe limitations on physical properties are still to be determined.



# Economic Importance of


By D. M. PETTY

*Bethlehem Steel Co., Bethlehem, Pa.*


*Discussion by G. Cook Kimball, Vice-President of Illinois Steel Co., Chicago, and W. B. Gillies, Vice-President, Youngstown Sheet & Tube Co., Youngstown, Ohio*

D. M. PETTY graduated from Lehigh University with the degree of E. E. in 1909. He is now superintendent of the service division of the Bethlehem plant of Bethlehem Steel Co. Mr. Petty is also past president of the Association of Iron and Steel Electrical Engineers.

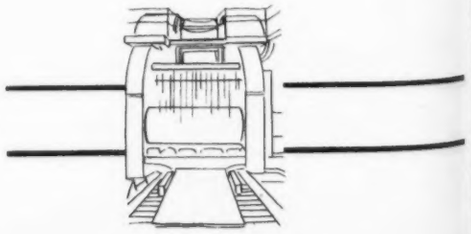
IT is natural that a subject which emphasizes the importance of economics in relation to replacements and obsolescence should be of interest to American Iron and Steel Institute, because no other industry has torn itself down and rebuilt itself to a greater extent than the steel industry. This is apparent when we think of the present size of iron and steel producing units and how they have grown through successive generations, from blast furnaces of 5 and 25 tons capacity to modern blast furnaces of 1000 to 1500 tons; from open-hearth furnaces with 10 tons capacity in 1886 to modern open-hearths with 150 tons capacity or more. Each time there was a substantial increase in capacity of these furnaces, it meant, in general, a complete replacement of the unit. Many men working in our steel plants today have seen the complete rebuilding of their department as often as three times in 30 to 40 years of service.

Economics is defined as the science which investigates the conditions affecting the production, distribution and consumption of wealth. In this discussion it may be defined as a study of the conditions which affect the probable profit which may accrue from certain expenditures intended to improve the earning capacity of a steel mill. Such studies will usualy take the form—"Shall the replacement be made?"—"Shall it be done now?"—"Shall it be done this way?"

Obsolescence may be defined as the loss in service value due to diminished earning capacity caused by advancement in the art or changes in market conditions which demand a quality of product beyond the ability of the unit, or demand a quantity greater than can be produced, or less than is economical. This process may be a gradual one, the unit becoming less valuable by a small amount each year, or it may become obsolete over night.

It should be noted that as soon as one venturesome soul makes a radical change in the size, or otherwise improves a producing unit and successfully puts it into operation, all other such units which are not as efficient as the new one must be considered obsolete.

A casual survey of our subject will reveal that it is utterly impossible to cover, in the short space of time available, all of its phases as related to the steel industry. Therefore we will start our discussion at the point where the raw materials arrive and stop where



* Paper presented before the general meeting of the American Iron and Steel Institute, at New York, May 23.

# the Replacement of Obsolete Equipment In Steel Mills*

the finished or semi-finished product leaves the steel plant.

### Four Reasons for Replacement

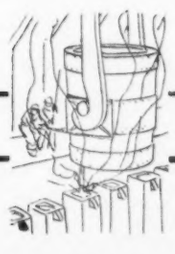
In thinking of replacements, a logical discussion can be laid out on the basis of what causes a replacement to be made. These causes can be grouped into four general divisions.

First: *A unit may be replaced because it is worn out.* This classification covers all types of furnaces, machinery, buildings and even foundations, because by their use their component parts become worn and they are affected by atmospheric conditions, which cause deterioration—rapid or slow, but always in some form. Repairs, of course, tend to retard this gradual wearing out, which is quite frequently called depreciation. The accounting profession has set up elaborate systems for accumulating reserves to cover depreciation so that when the unit is finally retired from service its value may be removed from the books without loss. Units which depreciate rapidly and which are replaced several times in one year, or even once in two or three years, are frequently covered by what is known as a rebuilding fund rather than a depreciation reserve. In these cases it often occurs that at the end of ten years, the unit, having been rebuilt many times, has been improved here and there, and so far as results are concerned may be a somewhat better unit than when it was originally built. In spite of this, however, there has been a certain depreciation of other parts which are not so easily improved without replacing the entire unit.

We have other units which, while not badly worn, except for some one or two parts, are finally renewed because of the failure of one of these parts, making it necessary to renew not only the part which caused the failure, but also many other parts. The repairs to such a unit are usually made in such a manner that the defects in materials or design are corrected and that a failure of the same kind is not to be expected in the future.

Replacements under this classification may be considered as being caused by depreciation rather than by obsolescence, but when the time comes when repairs are needed to so many parts that a replacement should be made, all the information which has been gathered in the operation and maintenance of the unit should be utilized so that the replacing unit is better than its predecessor.

Second: *A unit may be replaced because it is not producing a satisfactory product from a consumer point of view.* This classification maybe sub-divided into two parts:



(a) Where the unit does not produce a satisfactory product as it did when originally installed. It may sometimes occur that the unit may be diverted to other lines of work and yield several additional years of service. Nevertheless, if the market is to be supplied with the product of such a unit, a new unit must be installed.

(b) Where the unit still produces as good a product as when originally installed, but where demands of the market have materially increased since the original installation, and the unit is not able to meet the increased requirements, it then becomes a matter of deciding whether the new unit shall be installed to meet the current market requirements or whether considerably greater refinements shall be included in order to satisfy not only the immediate demands, but also to anticipate possible additional requirements. That action may have the effect of attracting additional customers for this particular unit, thereby increasing its salable output. That very condition may make it apparent that a unit of greater capacity is desirable. A careful survey must be made in order to determine the probable future market for these products so as to avoid the possibility of installing a unit and finding, shortly, that the market for its products has disappeared.

When a new unit is installed which is capable of producing a somewhat better product than is currently on the market and which the users of such product can and will absorb to their advantage, the obsolescence of all the other units producing the same product whether they are in that plant or competing plants is immediately advanced.

Accelerating obsolescence in all other units may or may not be good economics, depending upon such

factors as increasing the number of potential customers by virtue of a better product and by entering into an entirely new field hitherto not invaded by this particular product.

Third: *A unit may be replaced because the cost of production on this unit is high, and therefore the profits, by virtue of its operation, too low.* This may be caused by many factors which a new unit might correct, such as excessive cost of repairs because the unit is too light for its work, or where its parts are worn to a point where the replacement might properly be put in the first classification. The labor costs for operating the unit may be excessively high, which may be caused by an attempt to get out greater production than that for which the unit was designed, thereby necessitating additional men in greater proportion than the increased production. The man-hours remaining stationary, the increased cost may be due to a general increase in the rates paid to the operators. The man-hours may be materially increased to improve the quality of the product and to make it meet the demands of the trade. The economy of the unit, as related to its fuel, power or raw material consumption may be low. This low efficiency may be due to an inherently poor original design or to the gradual wear and tear of all or certain parts of the equipment. The high cost of production may be caused by material increase in the cost of raw materials used. This increase, in turn, may be caused by an exhaustion of the local supply, thereby necessitating bringing materials from more distant points; or it may be caused by an increase in freight rates, even to the point where the raw material originally used is dropped and something substituted in its place, such as oil for coal, electricity for gas, etc. A change in the social laws may require extra men or unusually high expenditures for supplementary equipment. Necessary safeguards against accidents may become such an item of expense as to make replacement necessary.

When making a replacement, due to the high cost of production on the existing unit, there is always a tendency to install a unit of greater capacity because, generally speaking, a greater output means lower unit cost.

Fourth: *A unit may be replaced because more capacity is desired.* The first consideration in this case is, shall additional units be added to the equipment already in service, or shall some of the existing units be removed and larger ones installed in their places? Where quality is not adversely affected by an increase in the size of the unit, or where seasonal fluctuations in demand are not excessive, the larger unit almost universally will be more efficient and show lower operating costs per unit of production. Where the total number of units is limited, substituting one large unit for a number of small units might leave the department inflexible as to tonnage during dull periods, especially if several grades of a product are required to meet market conditions.

In reaching a conclusion on this point the reduction in operating and maintenance costs of the larger unit must not be overlooked. In the past the trend of the steel industry has definitely been toward larger units. Whether this trend will carry on to still larger units remains to be seen, but the lessons of the past few years will enable managers and engineers more accurately to arrive at the correct solution of this question for their particular plant.

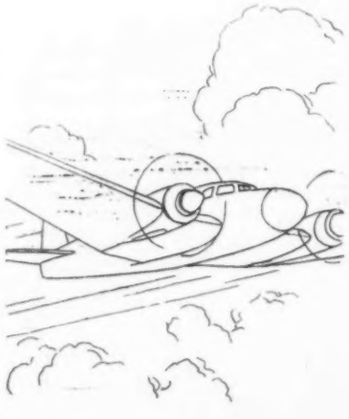
It is evident that there is a very close relationship between depreciation and obsolescence and that either one must include the other. That is, if a high depreciation rate is set, a replacing fund may be set up before the unit has become obsolete, which is another way of saying that the unit will wear out before it becomes obsolete. There has been much discussion as to how the remaining part of the original cost shall be disposed of when a unit is to be replaced because it has become obsolete. One school of thought would add this undepreciated remainder to the cost of the new unit. Another school insists that this undepreciated remainder is a loss and must be so considered and charged off at once; that it is unsound economics to charge against the new unit anything which pertains to the old. This latter policy would appear to be more sound than the former, because it prevents building up a capital structure not supported by real values in plant and equipment.

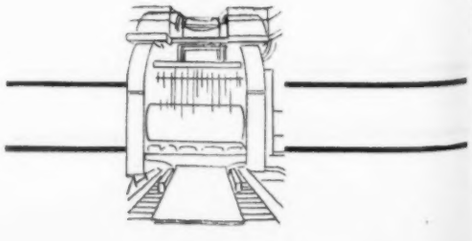
It would appear that it is rather improbable that the correct depreciation rate can be set at the start of operations of each unit, even in a small plant. Therefore some average figure should be set up for the entire plant to provide a depreciation reserve so that some units will be depreciated before they actually go out of service, while others will be taken out of service before they are depreciated to their scrap value, the remainder being charged to this rserve at once.

The economics of replacing obsolete equipment, i.e., equipment which fails to measure up to the present day standards of efficiency, is more a matter of management than of accounting, and it may prove to be better business to scrap an entire plant and replace it with a modern one, if improvements in the art have been so rapid that the decreased manufacturing cost in the new unit will earn greater profits than the old plant even with its considerably less capital charge. Capital charges in this case include interest, taxes, depreciation and/or obsolescence.

### Obsolescence Formula

From a management point of view, it may be utterly impossible to keep an obsolete plant in operation. This may be caused by such factors as: First: decreased selling prices, caused by competition, which may be lower than the manufacturing costs in an obsolete plant. Here it is obvious that no profit can be earned. Second: The





quality of the product offered by competitors with modern plants may make it impossible to sell the product of an obsolete plant, which certainly means that no profit can be earned on the old plant. Third: The difference in manufacturing costs between the modern plant and the obsolete plant may be such as to make the new investment even better than the original investment, the selling price having remained the same. This theory may be reduced to a general mathematical formula.

Cn equals unit cost of production for the new unit.

Co equals unit cost of production for the old unit.

Pn equals annual production capacity of new unit.

Po equals annual production capacity of old unit.

K equals per cent of time new unit will average in operation over its life.

D equals per cent of depreciation for new unit.

O equals per cent of obsolescence for new unit.

Z equals total profit per unit of production on new unit.

A equals total cost of new unit.

M equals cost of money in annual percentage.

$$[(Co - Cn)\ Po + (Pn - Po)Z]\ K - [(\text{The greater of AD or AO}) + AM] \div A \times 100 = \text{per cent profit.}$$

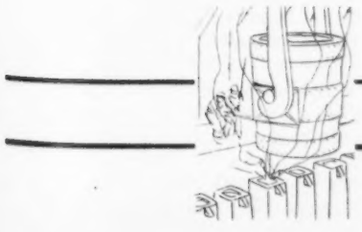
It should be noted that in applying this general theory or formula to a steel plant, there is one factor which must never be overlooked: it is entirely futile to enlarge any one unit to such an extent that it is entirely out of step in producing capacity or in speed of production to those units which are just ahead of it and supply its incoming material, or in comparison with the succeeding departments which take its output. The continuous flow of steel through the plant must not be interrupted. Of course this does not mean that improvements in a unit which affect costs and quality only cannot be made without a corresponding change in the preceding and succeeding units, because it is logical to improve the weakest link in the chain of production rather than rebuild the entire chain, so long as the capacity of the unit is sufficient to supply the market.

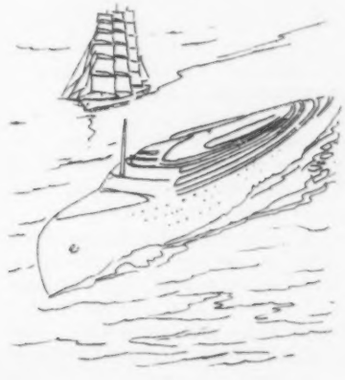
An inspection of this formula will reveal one obvious fact: the first part of the equation, that is, the savings per unit multiplied by the annual capacity of the old unit plus the increased annual capacity of the new unit multiplied by total profit per unit and all by the load factor, must be greater than the other factors which are to be subtracted, otherwise there can be no profit.

$$[(Co - Cn)\ Po + (Pn - Po)Z]$$

The two factors, old unit cost and new unit cost, are usually rather easy to determine and the difference between these two unit costs will be fairly constant. An increase in the cost of raw materials will affect both factors alike except that, generally speaking, a new unit usually has a better practice percentage than the older unit, which will tend to increase the difference in cost with a rise in raw material cost. In the matter of labor, as a general proposition, new processes or new machinery involves less labor per unit of production; therefore as the cost of labor in general increases, the difference in unit cost will be greater and in favor of the new unit.

The producing capacity of the new unit is a matter of design and must be determined in advance by a very careful study of the market trend. Ordinarily, unless the market trend is upward and a greater volume of business is expected, a new unit should not be considered, and certainly will not be considered if the market trend is downward.





### Determining the Factor "K"

The most uncertain quantity in the formula is the load factor "K." This represents the average percentage of time the new unit will operate at full load each year during its life. Management must examine the market trend to determine both what the past experience has been and something about the future, not only with reference to the present outlets but also as to the possible additional outlets for the product, such as how much wider will be the distribution of the particular product if its selling price can be reduced or its quality improved. A condition which may materially affect this factor is change in buying habits of the public or a change in the style of the product. If the product is a staple commodity, such as pig iron, the probability of any great change in the demands of the buying public is considerably less than if the product is one which is subject to frequent style changes. In some cases, the product in question may be only an adjunct to the principal commodity, so far as the ultimate sale is concerned. For instance, the steel rim for mounting solid rubber tires for trucks has reached a rather stable condition so far as its particular design is concerned, but the market for solid rubber tires is rapidly disappearing, owing to the fact that highway commissions have virtually ruled a solid tire truck from the highways, and the demand for greater speed from trucks has made the solid rubber tire impractical. Therefore, it would be poor economics to make an investment in equipment for manufacturing rims for solid tires.

Seasonal demands can sometimes be met by operating the manufacturing processes at a more or less continuous rate throughout the year and storing the surplus production during the slack sales months in order to meet the rush demand at the other seasons of the year. Whether it is better policy to operate at a steady annual rate and store against the rush season or to install equipment sufficient to meet the rush season demands and shut down this particular unit during the dull season, is one which can be answered only after a detailed study of the product in ques-

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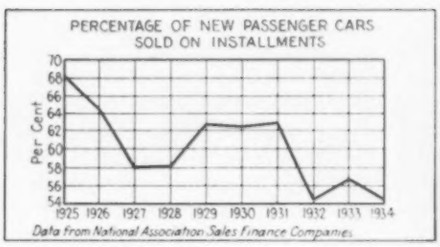


# THIS WEEK ON THE

## June Assemblies Estimated at 375,000 Units; Labor Outlook Worrisome

DETROIT, May 28.

THE automotive picture at the moment is a curious mixture of lights and shadows. The onlooker can see in it whatever he chooses to see. In production and sales, the first five months of 1935 have surpassed the fondest hopes of the industry. June also is full of promise. The summer season is likely to be sufficiently lively to satisfy most sales executives.

Yet one can't help but view with misgivings the shadows cast by agitation fomented by union organizers. Car manufacturers are bitterly opposed to the Wagner Bill. They are about to witness unionism foisted upon them by Government fiat and are troubled by the outlook. That is, all except Mr. Ford. He shrewdly raised his minimum daily wage to $6 and gathered unto himself invaluable good will and publicity as a result. The Dearborn genius seems to have the knack for locking the barn before the horse is stolen. Others fret and fume and try to do something after the horse has departed.

Manufacturers are balking at renewing their code. Now that the tool and die season for 1936 cars is almost here, the Mechanics' Educational Society is doing its best to stir up trouble among the workers in Detroit tool and die shops. Pamphlets and other printed matter are being distributed to the men, and union organizers are plying their persuasive trade in an effort to get increased membership and to stir up discontent. If the industry gets through its tooling season without any serious attempts to tie up work in tool and die shops, it will consider itself lucky. Of course, some of the orders are going outside this district.

### G. M. Plays Hide-and-Seek

General Motors is playing a game of hide-and-seek with the AFL. The fine degree of integration of the industry, admirable so far as productive efficiency is concerned, makes it extremely vulnerable to organized labor's program of periodic strikes. If the manufacture of one part can be effectively stopped, car output is paralyzed, unless the management happens to have had a hunch regarding trouble ahead and hence has built up a stock of parts.

Unfortunately the management cannot afford to rely on hunches. General Motors is busily engaged, therefore, in providing more than one source within its ranks for all parts produced by the corporation. It is applying to itself, after a bitter lesson, the same rule which it applies to outside suppliers: namely, that there must be three sources of supply. After Chevrolet finishes its program of spreading out work, it won't surprise anyone in Detroit if transmissions are built in Toledo, Muncie, Flint and Saginaw. Better sacrifice a little volume concentrated in one spot than lose $450,000 a day during a strike. It's cheaper in the long run.

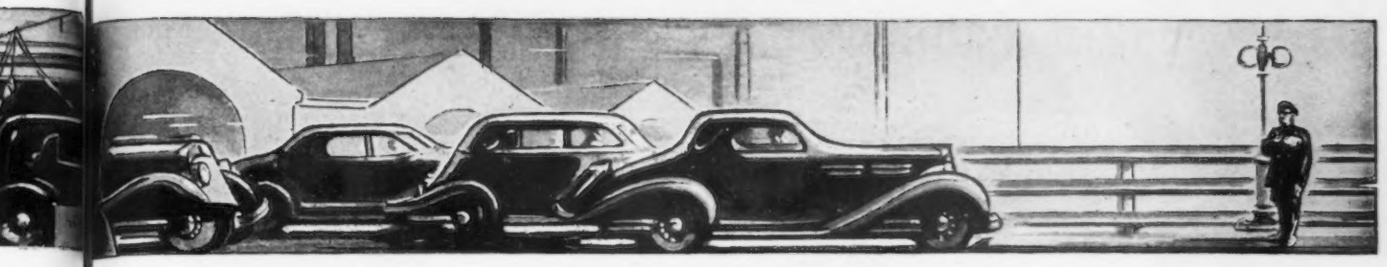
A spot which is worrying General Motors somewhat is the present concentration of knee action units in the local Chevrolet plant. On the other hand, the AFL has discovered that Detroit workers aren't so ready to walk out as employees in some other cities. In fact, an AFL officer ruefully remarked recently that Detroiters don't seem to mind at all going through picket lines. He had special reference to an unsuccessful strike called last year at Murray Corpn.

### No More General Strike Threats

The Toledo strike settled one question which long has been debated in AFL ranks. There will be no more threats of general automobile strikes. The technique will be to try to bottle up the production of one manufacturer and make him sweat while he watches his competitors corral his sales prospects and sign up his dealers. When he has had enough of this sight, the AFL thinks he will want to make his peace with them. There is no denying the fact that the AFL is talking in bolder, more confident tones since the Toledo strike.

Ford is the one company which completely puzzles the federation officers. They admit that they are unable to make any headway at Dearborn. Ford successfully ignored NRA, although more than fulfilling its hour and wage provisions, and is successfully ignoring the AFL. The AFL doesn't like the situation, but doesn't know what to do about it. Meanwhile, Ford proceeds to make cars almost at full capacity without fear of interruption due to labor troubles.

May assemblies are estimated at about 400,000 units. Tentative schedules for June put production at 375,000 units. While Ford is ex-



# ASSEMBLY LINE

BY BURNHAM FINNEY

*Detroit Editor, The Iron Age*

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pected to drop off from 160,000 cars this month to 130,000 next month, Chevrolet will increase its output to around 115,000 units in June, whereas in May it turned out only 50,000 to 60,000 units. This means that in the first half of this year the industry will build approximately 2,365,000 cars and trucks, a record exceeded only in 1926 and 1929. In the first six months of 1930, assemblies totaled 2,309,265 units; in the same period of 1928 the number was 2,326,509.

### Expect 3,750,000-Car Year

Whereas early in the year the industry was content to talk about a 3,350,000-car year, it now anticipates that 1935 production will touch 3,750,000 units. That isn't so hard to figure. It would call for the building of around 1,390,000 cars in the last six months, or about 231,000 units a month. Assemblies in the last half of 1934 amounted to 1,099,206 units. In the July-December period of 1930 they were 1,200,913 units. This year they will get the "shot-in-the-arm" effect from October introductions and November shows.

There is likely to be a rush by car manufacturers to beat the New York show gun on 1936 models. Introductions will start in September, and October is expected to bring numerous entries, including models of some General Motors and Chrysler divisions. As usual, Ford has everyone guessing. Henry Ford always has shuddered at the thought of annual models and has accepted them largely because his competitors forced them on him. Now that he has a car which is clicking amazingly with the public, it is believed that changes in design for 1936 will be slight.

There will be improvements in materials, as usual, which give better car performance. More parts will be made of alloy cast steel in the new division of the Ford foundry devoted to such products. There appears to be a strong possibility that Ford will go to an all-steel top in 1936. The fact seems definitely established that the 12-cylinder Lincoln to be offered in the $1,000-$1,200 price range will have a steel top. The new Nash 400, just announced, is equipped with a steel top. Next year all General Motors cars, Hudson-Terraplane, Nash-Lafayette and Lincoln will have the turret top. If Ford falls in line, as expected, it won't be long until the conventional fabric top will be dropped by all manufacturers.

### All-Steel Top Here to Stay

Fisher Body, which pioneered the turret top, has conducted exhaustive tests showing that the car with an all-steel top is cool in summer. Any rumbling noise has been effectively eliminated by proper insulation. Hence the steel top stands ready to take its place alongside four-wheel brakes as a permanent advance on the part of the industry.

General Motors is expected to retain knee action next year on all its lines which now have that feature. It seems committed permanently to independent front wheel suspension, as indicated by President Sloan in his annual report to stockholders. Chrysler engineers are understood to have been dabbling with the idea of independent suspension on all four wheels, but the necessity for keeping costs down probably will result in an adverse decision.

All manufacturers next year will continue to standardize as much as possible on parts for more than one line of cars in order to effect savings. This year, for example, the Pontiac, Oldsmobile and LaSalle bodies are said to be made from the same dies. The body design for the entire Studebaker line is such as to permit the use of interchangeable die sections and some interchangeability of parts. The same idea was carried out in the Chrysler Airflow bodies, the back panel being interchangeable on all body styles, including the De Soto.

### 1936 Tooling Work Starts

The Chevrolet Standard has been unaltered in appearance since the early spring of 1934, consequently a considerable change is looked for this fall. In general, however, tooling up will be confined to just enough changes to enable car manufacturers to say that they have a new line. One General Motors division already is having its tools and dies for 1936 built and another division is now asking for bids on its work. A large company which does a substantial business in making tools and special fixtures for motor car makers is insisting that all employees take their vacation before the end of July, so that the organization will have its full strength in August.

Fisher Body is reported to have inquiries out for equipment for its Pontiac plant, which will be greatly enlarged for 1936 production. Pontiac may not buy further equipment to expand its capacity for some time, since it will not need additional facilities until the spring of 1936. Ford is said to have closed for a number of machines to be shipped to the Maford organization in France. Prospects continue hot for a comfortable volume of equipment buying during the next 60 days.

Chevrolet, smarting under two major production reverses this year, has high hopes for 1936. It is understood to be tentatively planning on building well over 1,000,000 cars next year and intends to have 35,000 to 40,000 cars in dealers' hands by the time of the New York

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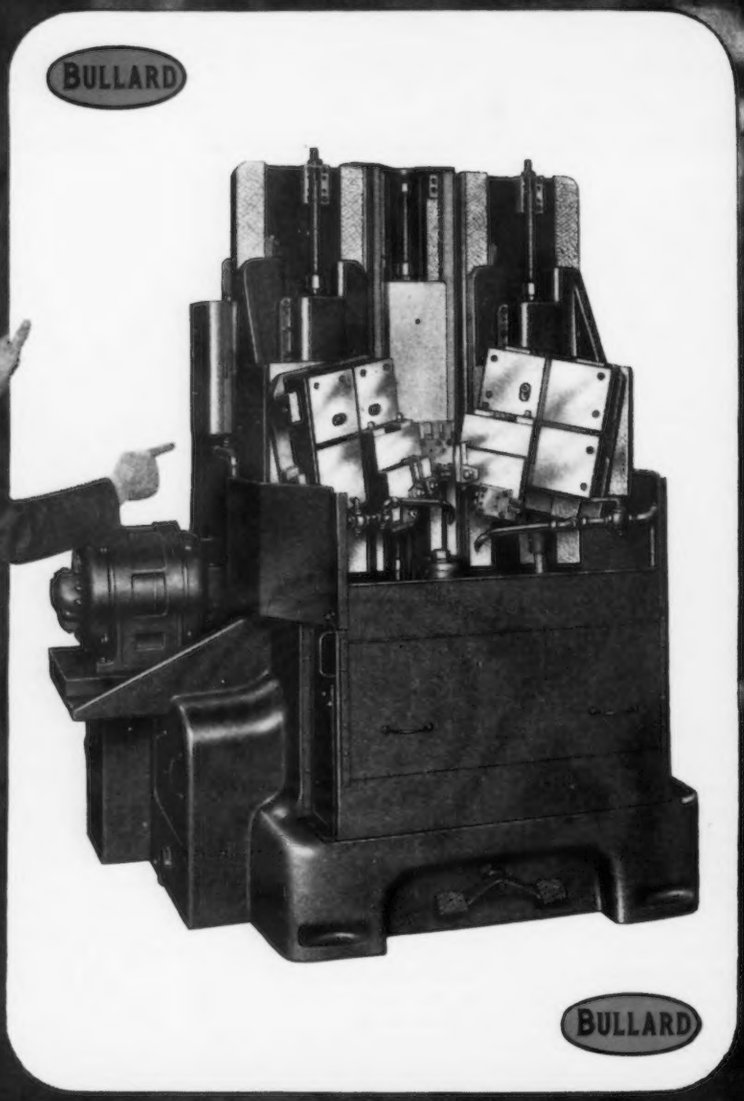
# PLAY the ACE against Obsolescence




"Jim, it's high time we looked facts in the face. In order to better our Production Times, we must buy equipment to replace Obsolescence. This time, let's play the Ace against that Invisible and Destructive force. We already know the points for replacement, and here's Bullard Single Spindle Vertical Automatic Lathe for savings in one of those departments where manufacturing costs are running much too high. You know — Time Saved is Money Earned, so don't put this off any longer. We can use that extra profit that this machine will make, so get in touch with Bullard NOW — Have their representative call, and most likely he'll find other jobs for Savings — and How we can use those Savings! That's all — EXCEPT — Get Going!"

There is a Bullard Engineer waiting for Your call.

BRIDGEPORT **THE BULLARD COMPANY** CONNECTICUT

# NEWS OF THE WEEK

## Better Selling Is Keynote At N. M. T. B. A. Spring Meeting

AGGRESSIVENESS in meeting changing conditions was the challenge issued to the National Machine Tool Builders' Association, which held its 33rd spring convention, May 21 to 23, at Chicago. Its president, Charles J. Stilwell, vice-president of the Warner & Swasey Co., took the forward view when he outlined constructive suggestions designed to enhance the value of the association to its members. He pointed out that some of the new methods of doing business will remain with the industry regardless of the length of life of the code, which has some good features as well as some disadvantages. After all, changes are more or less relative and worrying about them is only a waste of time.

All indications point to the fact that the association is functioning well in its approach to the problems of management. In engineering the association cannot be an important cooperative agency inasmuch as design is primarily a function of demands that are created by users of machine tools. However, in the matters of standardization and research the association is prepared to take a leading hand. Study of production management was urged as a part of the association's work.

### Better Selling is Needed

It was frankly admitted that the industry should do a better job of selling. Marketing problems require more study and planning and in these the association should take an active part. The expanding market of pre-depression days is no longer here and the question arises whether or not present sales organizations are actively alert to current demand which is for machine tools that will do better work and at lower cost. The depression has resulted in retention of only the best in each sales organization and yet results are not wholly gratifying. It was contended that machine tool selling is not only badly executed but poorly conceived and that the fault does not rest so much on salesmen as on management.

It is the business of the sales manager to know not only where he gets business, but how he gets it. As to the salesman, there is a serious question as to how often he really makes the suggestion that leads to a sale. The association can help by making a thorough study of fundamental principles underlying the distribution of machine tools and on this score it was suggested that a market council group be formed.

### *$6,000,000 from Old PWA*

The old public works program, now about completed, afforded the industry about $6,000,000 in business, according to Herman H. Lind, general manager of the association. He estimates that governmental departments are in need of about $30,000,000 worth of new machine equipment. It is being brought to the attention of the Government that expenditures of money for public works means more than giving jobs to the idle. By proper expenditures many men who have been forced out of machine-building shops can be rehabilitated.

Social and economic changes in Europe prove that business men, though faced by terrific odds, carry through. With such examples before us there can be no reason to doubt the tenacity of the American business man. Most users of machine tools are in the position wherein they can sell their products only at the right prices. Much of their equipment is obsolete. The fact of the matter is that the buyer has reached the point where he wants to buy, but in most cases he hesitates to take that position openly.

In the matter of making individual sales it was urged that the seller view the problem as one advancing the whole industry. The profit motive should not be forgotten and real service must be placed at its true value. Excessive demand for service on old machines will come as business improves and profit should be realized on that service.

### Shortage of Skilled Labor

It is estimated that the industry is short 35 per cent of the skilled workmen it employed in 1929. Code or no code, wages will remain up and shorter hours will be worked. There is danger of disarrangement of industrial employment if managers rely on taking needed men from other plants either in or out of the industry. A satisfactory alternative is to develop men within the shop. This work should start at once. Select employees carefully and appraise them as to interest and ability to do more important work. Apprentice and specialized training should continue.

Dramatization in advertising was stressed by Logan Anderson, Lakeside Press, Chicago, who urged that machine tool advertising be placed where it belongs. He raised the following points: find out the users' problem and stress it in advertising copy; dramatize processes and service; play up the advantages of your product; dramatize the performance of your product; em-

phasize social viewpoint and human interest; do not expect your advertisement to sell directly; and, continuity is of utmost importance. The real purposes of advertising are to gain good will, predispose the customer to your product, and to assist your salesmen.

Judgment of management can, in many instances, be doubted in matters pertaining to price adjustments, according to G. P. Torrence, president, Link-Belt Co., Chicago. It is all too easy to think in terms of downward adjustments before full study and consideration have been given to costs which in any final analysis should be the determining factors. There is ever present the eternal business triangle of cost, selling price and profit and it is the interrelationship of these three factors that determine success or failure. The real goal is 100 per cent operation at a profit, and in these days of rising operations and also climbing costs special consideration should be given to upward adjustment of selling prices.

### Over-estimate Savings on Volume

There is a strong tendency to overestimate the savings resulting from volume production. A recent study reveals the following:

| | Production Capacity | | |
|---|---|---|---|
| Item (cost per $100 of sales) | 50% | 75% | 100% |
| Material | $32 | $32 | $32 |
| Director labor and shop expense | 32 | 30 | 28 |
| Sales, administration and | 26 | 23 | 21 |
| Fixed expense | 10 | 7 | 5 |
| Total | $100 | $92 | $86 |

In the jump from 50 per cent to 75 per cent of capacity the gain in lower cost was less than 10 per cent and in the jump to 100 per cent operation the lowered cost was not above a 15 per cent gain. Basically machines are purchased for what they will do, and a 10 per cent price advance means little on the cost if spread over the liquidating period even if it is so short as a year. The practice of reducing costs and then in a carefree manner lopping 5 to 10 per cent off the top is to be unreservedly condemned.

A special feature of this convention was the complete breakdown of the index of machine tool orders by Mrs. Frida F. Selbert, secretary of the association.

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The Pittsburgh Cold Rolled Steel Co., Verona, Pa., has reopened its plant, which has been idle for some time.

# Porcelain Enamel Institute Reviews Year of Progress

THAT activities inaugurated a year ago by the Porcelain Enamel Institute to expand the market for porcelain enameled products have already begun to bear fruit was brought out at the fifth annual meeting of the institute, held at the Hotel Statler, Cleveland, May 23, which was attended by over 200 representatives of various branches of industry.

The organization of an educational bureau to broaden the market for porcelain enameled finishes for metal was authorized at the annual meeting last year, and this bureau started functioning during the latter part of the year. This year a budget providing for the expenditure of $32,800 in this promotional work has been prepared and nearly one-half of this amount had been pledged before the meeting. An appeal for additional pledges to this fund was made by Kurt R. Groener, recently appointed managing director of the institute, in a talk on investing to increase one's business.

### Advantages of Cooperation in Sales Promotion Cited

Accomplishments of the institute since its organization were reviewed and plans for the future were discussed by the president, R. W. Staud, Benjamin Electric Mfg. Co., Des Plaines, Ill. Members of the institute, he said, had learned the advantages of cooperation to promote sales and to eliminate unfair trade practices. He urged the necessity of cooperation to expand the market for porcelain enamel products, to maintain sound manufacturing methods and practices and to prevent the encroachment of other finishes.

He predicted greater growth of the industry in the next five years than in the same past period. However, the increased volume must be profitable, he added. Mr. Staud recommended that the institute increase efforts to enlarge its membership, and that it take in as members operators of sign jobbing shops and some other groups, such as makers of washing machine tubs and kitchenware. He urged cooperation with the Federal Housing Administration, the organization of an architectural building service to promote the use of porcelain enamel in building work, more attention to tariffs because of the possible effect of imports on the Eastern market, a uniform cost accounting system and a study of the problem of industrial relations.

Accomplishments of the educational bureau were discussed by E. L. Lasier, Titanium Alloy Mfg. Co., Niagara Falls, N. Y. This bureau is divided into four sections: test research, market research, advertising and sales promotion and industry contact activities. The work of the different sections is being coordinated.

### Reports Gain in Porcelain Enamel Sales

Mr. Lasier said that porcelain enamel sales had increased 15 per cent during the depression and that a goal had been set to do $24,000,000 worth of business in 1936, or double that of 1932.

Present and future markets were discussed by George S. Blome, vice-president, Baltimore Enamel & Novelty Co., Baltimore, who emphasized the need of market research, and by Mr. Groener. An important potential market for porcelain enamel, it was pointed out, is in the building field and for wall finishes in bathrooms and kitchens.

### Urges Dissemination of Technical Data

Various commercial problems must be solved by the technical research committee, said Richard H. Turk, Porcelain Enamel & Mfg. Co., Baltimore, who added that this work does not conflict with the technical activities of the American Ceramic Society. He stressed the value of inorganic finishes and spoke of the competition of paint, lacquer and other organic finishes and of Monel metal, stainless steel and chrome and other electroplating. Architects, he said, must be provided with technical data regarding porcelain enamel in order to induce them to specify that finish in the building field and that until this is done the porcelain enamel industry cannot get its share of business in that field.

Increase in the use of porcelain enamel in the sanitary ware industry was predicted by Mr. Turk. Porcelain enamel sinks, a recent product, will be followed, he said, by porcelain enamel bathtubs and lavatories. Attacks recently have been concentrated against the use of porcelain enamel for refrigerators, he said, the biggest competitor being the paint and varnish industry. R. M. King, Ohio State

University, recommended the appointment of a part-time technical advisor.

Advertising and sales promotion were discussed by H. V. Mercer, American Rolling Mill Co., who stressed the importance of maintaining and expanding present markets and opening new markets. A recently conducted test advertising campaign was outlined by H. D. Chase, Chicago Vitreous Enamel Products Co. This will be followed by a trade campaign.

### Educational Film Shown

Educating the trade and sales people on the selling advantages of porcelain enamel was discussed by R. A. Weaver, Ferro Enamel Corpn., Cleveland, who stressed the need of educating retail clerks and through them customers as to the advantages of porcelain enamel finishes. He recommended demonstrations in stores and display of sound films exploiting the advantages of porcelain enamel finishes. A film recently produced for this purpose was shown.

A refrigerator cabinet formed from one piece of steel and having only one exterior coating of porcelain enamel was visioned by A. M. Sweeney, sales manager of the specialties division, General Electric Co. Were only a single coating applied, the price differential between the porcelain enameled refrigerator and those in other finishes would be reduced one-half, in his opinion.

### Advances in Firing Enamel Noted

Great progress has been made in firing enamel and the production of enameled parts during the past few years, the speaker declared. As a result, breakage and chippage in shipment and in use has been sharply decreased. Chippage of refrigerator interliners, he said, has been reduced by the production of a more opaque white enamel, permitting the use of only one coat for interliners. Chipping of range parts is still causing difficulties, and 15 to 20 per cent of the electric ranges made require some new parts. He suggested that a lower standard of white might be adopted for refrigerator cabinet exteriors so that only one coat would be required and thus narrow the price differential between porcelain enamel and other coatings.

The General Electric Co., Mr. Sweeney stated, made 1,700,000 porcelain enamel coated evaporators for refrigerators before substituting stainless steel evaporators. The old type of evaporator, he said, was very difficult to enamel and, had the present design of evaporator been adopted before the change in the material, the manufacture of the porcelain enamel coated evaporator probably would have been continued. Mr. Sweeney predicted a tremendous increase in the sale of electric dish washers, the porcelain enamel tubs for which will provide an important field for the porcelain enameling industry.

Bennett Chapple, vice-president, American Rolling Mill Co., predicted that store fronts and other exterior uses would provide a tremendous field for porcelain enamel. He thought that the number of refrigerators with porcelain enameled cabinets might be increased to 80 to 90 per cent of the total made should a satisfactory single coating be developed. Last year, something over 20 per cent of the refrigerator cabinets were porcelain enamel coated.

### Officers, Executive Committee and Board of Trustees Chosen

Officers of the institute were elected as follows: President, Robert G. Calton, vice-president, Tennessee Enamel Mfg. Co., Nashville; vice-presidents, F. E. Hodek, Jr., vice-president, General Porcelain Enamel Co., Chicago, and E. L. Lasier; secretary, Kurt C. Groener; treasurer, William Hogenson, president, Chicago Vitreous Enamel Products Co., Cicero, Ill. (re-elected).

The following were elected to the executive committee:

Sign division, George S. Blome and F. E. Hodek, Jr.; table top division, W. H. Brett, Enamel Products Co., Cleveland, and R. W. Staud; jobbing shop division, Earle S. Smith, Toledo Porcelain Enamel Products Co., Toledo, and Louis Ingram, Ingram-Richardson Mfg. Co., Beaver Falls, Pa.; frit division, H. E. Ebright, Ferro Enamel Corpn., Cleveland, and W. R. Greer, Porcelain Enamel & Mfg. Co., Baltimore.

New members of the board of trustees are: Jobbing shop division: Earle S. Smith; Gustave Oesterle, president, United States Porcelain Enamel Co., Los Angeles; P. R. Clipp, manager, Roberts & Mander Stove Co., Philadelphia; William Mahoney, assistant general manager, Chattanooga Stamping & Enameling Co., Chattanooga; Louis Ingram. Sign division: George S. Blome; Edwin F. Guth, president, Edwin F. Guth Co., St. Louis; M. J. Saltzman, president, Porcelain Metals, Inc., Brooklyn; J. T. Penton, president, California Metal Enameling Co., Los Angeles, and F. E. Hodek, Jr. Table top division: W. H. Brett; Edgar H. Weil, president, Vitreous Steel Products Co., Cleveland; R. W. Staud; M. N. Hurd, president, Ingraham-Richardson Mfg. Co. of Indiana, Frankfort, Ind.; R. G. Calton. Frit division: William Hogenson; R. A. Weaver; O. Hommel, O. Hommel Co., Inc., Pittsburgh; Emery L. Lasier; W. Russell Greer. Cooperating division: Bennett Chapple; R. D. Landrum, district sales manager, Harshaw Chemical Co., Chicago; R. L. McGean, vice-president, McGean Chemical Co., Cleveland; F. S. Corrigan, vice-president, General Steel Wares, Ltd., Toronto, Ont., and L. D. Mercer, assistant manager sheet sales, Republic Steel Corpn., Youngstown.

At a meeting of the members of the porcelain enameling manufacturing industry, H. H. Winebaugh, Textile, Inc., New York City, was elected a member of the code authority representing the industry at large, and E. L. Lasier was named as a member representing the institute.

Resolutions were adopted opposing the ten-month extension of the NRA and favoring its extension for a two-year period.

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## Booklet Gives Data on Unit and Group Drives

ECONOMICS of individual motor and modern group drive systems are discussed in a 44-page book recently published by the Graton & Knight Co., Worcester, Mass. Drawings and other pictorial material predominate, the text having been kept to a minimum. Chapter headings include: Two Ways You Can Spend Your Income Dollars for Power Transmission; Investment Cost for Motors; Power Cost; Maintenance; Why Planned Power Transmission is Important During Times of Reduced Production; Where a Balanced System of Group and Unit Drives Brought Savings. From the pages picturing the proper application of both group and unit drives, the book goes on to show the importance of selecting the proper belt to provide highest efficiency in the correct drive. Useful charts and tables for figuring the power transmission requirements of any particular machine are included.

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Hatz Construction Co., Niles, Ohio, has made arrangements with the Stewart Furnace Co. to dismantle and merchandise its blast furnace plant at Sharon, Pa.

# Scrap Iron and Steel Exporters Form Permanent Organization at New York

THE scrap iron exporters of this country will continue to meet as a conference of the industry under the name of American Scrap Exporters Conference. This was decided at a meeting of the scrap export industry held last week at India House, New York, as part of the celebration of Foreign Trade Week.

Benjamin Schwartz, director general of the Institute of Scrap Iron and Steel, who presided at the conference, was authorized to appoint a committee of nine, representing all important export points, to act as an advisory board. More than 75 scrap exporters from New York, Boston, Philadelphia, Norfolk, Va., Baltimore, Jacksonville, Fla., New Orleans, Los Angeles and other shipping points, were present at the conference, in addition to representatives of foreign companies, and the following official Government representatives: Sadao Iguchi, consul general of Japan; Romolo Angelone, commercial attache of the Italian embassy, and R. B. Stevens, representing the British embassy.

The address of Ralph L. Harding, chief of the metals and minerals division, Department of Commerce, was covered in THE IRON AGE, May 23, page 50.

Mr. Schwartz, in a summary of the scrap export trade, pointed out that scrap today is the principal raw material used in the manufacture of steel throughout the world, for two reasons: (1) The development of the open-hearth process of manufacturing steel requires substantial tonnages of scrap in order to produce steel economically. The use of scrap in steel manufacturing is approximately 50 per cent scrap against 50 per cent pig iron, with the percentage of scrap running as high as 70 per cent in certain countries. (2) The conservation of iron ore and other natural resources brought about by the use of scrap has caused countries with limited iron ore reserves to scour world markets for available scrap.

Mr. Schwartz said that the large increase in scrap exports was probably a temporary condition. "The United States," he said, "is the greatest industrial nation in the world today and produces an abundance of scrap. When the scrap is not greatly in demand for domestic purposes it is a natural development that scrap should move out of our abundance in international commerce.

"The depreciation of the dollar has increased the purchasing power of foreign moneys. When exchanges are stabilized, we may expect a more normal situation in scrap exports.

"Although the United States is the leading producer of steel, it is operating at approximately 45 per cent of steel capacity against approximately 100 per cent of capacity in Japan, Italy and Great Britain. When American steel production is increased, the export movement will stabilize itself."

Mr. Schwartz also pointed out that the export movement has prevented hundreds of small business men from going into bankruptcy and that last year the collection and preparation of 1,800,000 tons of exported scrap represented over 12,500,000 hours of labor, with a payroll of over $4,000,000.

# Group Life Insurance Plan Announced by Steel Corporation

A GROUP life insurance plan has been offered by the United States Steel Corpn. to all employees of the corporation and its subsidiaries. The cost of the insurance will be borne jointly by the corporation and its employees. Upward of 200,000 employees will have an opportunity to avail themselves of this offer, enabling them to secure life insurance at a lower rate than would be otherwise obtainable. The offer is made on the express condition that at least 75 per cent of the employees eligible apply for insurance before July 1. It is roughly estimated, pending actual knowledge as to the proportion of employees that will take policies, that the plan will provide protection to the amount of close to $350,000,000, a figure approached only by the General Motors Corpn. group insurance plan.

Insurance will be issued without restriction as to age, occupation, sex or physical condition and without medical examination to employees that apply for insurance before July 1. Those who were eligible and did not apply before that date and those who subsequently become eligible and do not apply within 31 days will be required to pass a medical examination.

Employees leaving the company have a 31 days' option to convert their insurance, without examination, into any one of the forms of insurance customarily issued by the underwriting insurance companies with the sole exception of term insurance. The premium on a converted policy will be paid wholly by the former employee.

Group insurance will cease upon retirement of an employee on pension.

The amount of insurance for which application may be made and the cost per month to the employee are shown in the table. The employee's share of the cost will be deducted from the employee's salary or wages. The amount of insurance will not be reduced in case of decreases in rates of pay, but will be increased in case advances place an employee in a higher eligible class.

**SCHEDULE OF AMOUNT OF INSURANCE FOR WHICH APPLICATION MAY BE MADE**

| When Normal Annual Earnings of an Employee Are: | Amount of Insurance Shall Be: | Cost per Month to Employee: |
|---|---|---|
| $1,250 or less .... | $1,000 | $0.75 |
| 1,251 to $1,750 .. | 1,500 | 1.13 |
| 1,751 to 2,250 .. | 2,000 | 1.50 |
| 2,251 to 2,750 .. | 2,500 | 1.88 |
| 2,751 to 3,250 .. | 3,000 | 2.25 |
| 3,251 to 3,750 .. | 3,500 | 2.63 |
| 3,751 to 4,250 .. | 4,000 | 3.00 |
| 4,251 to 4,750 .. | 4,500 | 3.38 |
| Over $4,750 ..... | 5,000 | 3.75 |

Erection of structural steel for what is said to be the world's largest all-welded industrial plant, now under construction by the Austin Co., Cleveland, for the Electro-Motive Corpn., General Motors subsidiary, has been begun at McCook, Ill. The plant, the first devoted exclusively to the manufacture of Diesel locomotives, will require approximately 2000 tons of structural steel, which is being fabricated at the Austin shops in Cleveland for assembly on the factory site.

# PERSONALS

A. M. CANDY has been appointed consulting engineer on the staff of the Hollup Corpn., Chicago, manufacturer of welding wire and supplies. He will be engaged in the development of welding machines and other equipment and research and development work in improved welding practice. Mr. Candy is a graduate of the University of Nebraska with a degree in electrical engineering, and has been associated with Westinghouse Electric & Mfg. Co. for many years. He figured prominently in one of the first multiple-story welded buildings constructed in 1926 at the Westinghouse Works, Sharon, Pa., the first arc welded railroad bridge, which is across Thompson Run at Turtle Creek, Pa., and the construction of the Westinghouse Engineering Laboratory at East Pittsburgh. He is a member of the American Institute of Electrical Engineers, the American Welding Society, and the Engineers Society of Western Pennsylvania.

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FRANK J. FREY, vice-president of the Geuder, Paeschke & Frey Co., Milwaukee, has been elected president of the company to fill the vacancy caused by the death of Charles A. Paeschke. Mr. Frey entered the company in 1882, two years after it was founded by the late William Geuder and Mr. Paeschke. All three were brothers-in-law. FRANK FREY, JR., is vice-president and CHARLES W. PAESCHKE is vice-president and secretary.

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GEORGE L. BOURNE, SAMUEL G. ALLEN and FREDERIC A. SCHAFF have been appointed members of the executive committee of the Superheater Co., New York, with Mr. Allen as chairman of the committee.

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R. T. PIERSON has been elected vice-president and general manager of the USL Battery Corpn., succeeding A. A. MACLEAN, who has resigned. Mr. Pierson was formerly vice-president of the General Cable Corpn. and president and treasurer of the Bremer-Fully Mfg. Co.

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DONALD LOYHED has been appointed Cleveland representative, with office at 7500 Euclid Avenue, by the Read Machinery Co., Inc., York, Pa.

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PALMER LANGDON has been added to the research staff of the Lea Mfg. Co., Waterbury, Conn., and will be in charge of abstracting and indexing all available articles and papers published since 1900 on buffing and polishing.

A. M. CANDY

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ALBERT O. PLAMBECK, formerly connected with the Sherwin-Williams Co. and more recently with Ault & Wiborg Co. of Canada, has been appointed assistant technical director of Roxalin Flexible Lacquer Co., Elizabeth, N. J.

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R. S. READ, of the Halcomb Steel Co., Syracuse, N. Y., has been elected president of the Electric Metal Makers Guild. JOSEPH A. SCOTT, of the Driver-Harris Co., Harrison, N. J., has been elected vice-president, and J. H. CHIVERS, Park works, Crucible Steel Co. of America, Pittsburgh, is secretary-treasurer.

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HARRY O. AMES, formerly with the Crane Co., Chicago, will cover the Oklahoma territory, with office at 1028 N. W. Twelfth Street, Oklahoma City, for the Rawlplug Co., New York.

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PAUL S. MENOUGH, formerly of the Michigan Steel Castings Co., has been made Pennsylvania district representative for the Michiana Products Corpn., Michigan City, Ind. He will make his headquarters in the Chamber of Commerce Building, Pittsburgh. WILLIAM B. COOLEY, formerly general sales manager, Hevi-Duty Electric Co., has been appointed to cover Indiana and will maintain offices at 433 North Capitol Avenue, Indianapolis.

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A. G. BARAL has become affiliated with the Steelweld Machinery Co., Cleveland, as factory representative, and also will act as sales representative of Cyril J. Bath & Co., an affiliated used machinery firm. Mr. Baral has had wide experience in the machinery field, having been connected with Industrial Plants Corpn., New York, New Britain-Gridley Machinery Co., New Britain, Conn., with which he had charge of the service sales department, and with other companies. He is a reserve officer in the Army Ordnance Department.

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ARNOLD ANDREWS, advertising manager of the Bucyrus-Erie Co., South Milwaukee, Wis., has been elected president of the Milwaukee Industrial Advertisers' Association. He succeeds J. O. FERCH, Harnischfeger Corpn. E. J. GOES, Koehring Co., was elected vice-president, and VAN B. HOOPER, Louis Allis Co., secretary-treasurer.

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KARL LANDGREBE, vice-president of the Tennessee Coal, Iron & Railroad Co., was elected president of the Birmingham Rotary club, on May 22.

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HERBERT C. RYDING, retired president of the Tennessee Coal, Iron & Railroad Co., has been appointed a member of the Birmingham School Board for a term of five years.

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ALBERT C. BRUCE, president of the United States Hoffman Machinery Corpn., has been elected a director of the Worthington Pump & Machinery Corpn., Harrison, N. J.

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V. F. COVERT has been elected assistant comptroller of the Westinghouse Electric & Mfg. Co., East Pittsburgh. He has been associated with the company since 1911. He became chief clerk at the South Philadelphia plant in 1919, and assistant general accountant later in that year. In 1924 he was made works auditor there, and in 1926 was transferred to East Pittsburgh. He successively became supervisor of district accounting,

assistant general auditor and auditor of receipts and disbursements.

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HERBERT J. WINN, president of Taylor Instrument Companies, Rochester, sailed on May 15 for London on a five weeks' business trip.

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CHARLES KAUDERER has joined the Clearing Machine Corpn., Chicago, as Michigan representative. He has been connected with the stamping and die industries for many years with such companies as Fisher Body Corpn., Mullins Mfg. Co. and Motors Metal Mfg. Co.

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HERBERT F. SAUER, for the past 15 years manager of the Cleveland office of the Electric Storage Battery Co., Philadelphia, has been appointed manager of the Chicago branch. He is succeeded at Cleveland by William P. Roche.

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LEE WRIGHT, since 1902 identified with Zion's Cooperative Mercantile Institution, Salt Lake City, has been made sales representative for the Republic Steel Corpn., with headquarters at 401 Atlas Building, Salt Lake City.

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C. V. HACKMAN, formerly with the Harbison-Walker Refractories Co. as manager of the Mount Union, Pa., and East Chicago, Ill., plants, has been made manager of the plants of the Stowe-Fuller Refractories Co., Cleveland.

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DAN LEWIS has been appointed manager of the roll department of the Continental Roll & Steel Foundry Co., with headquarters in the Grant Building, Pittsburgh. W. E. CADMAN has been appointed assistant manager and will be located at the Hubbard Steel Foundry, at East Chicago, Ind.

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CLARENCE B. RANDALL, vice-president of the Inland Steel Co., has been appointed vice-chairman of the 1935 Community Fund drive for Chicago.

# OBITUARY

GEORGE H. CRESSLER, vice-president and general sales manager of the Stacey Mfg. Co., died at Cincinnati on May 21, aged 55 years. Mr. Cressler, previous to his 10 years in Cincinnati, was a captain in the Ordnance Department of the United States Army.

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ARTHUR L. STEVENS, president of the Arthur L. Stevens Corpn., Chicago, died May 11. He had practiced consulting engineering until seven years ago, when he organized the Stevens corporation, which specialized in consulting engineering on steel mill furnaces, and especially on open-hearth furnaces. Mr. Stevens was born in Maine 72 years ago.

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MARCUS T. LOTHROP, former president of the Timken Roller Bearing Co., Canton, Ohio, died of a heart attack at his home in that city on May 24, aged 50 years. He was graduated from the University of Michigan in 1906 and, after some years of experience as a consulting metallurgical engineer at Syracuse, N. Y., he went to Canton in 1911 as chief metallurgist for the Timken company. He was elected president in 1929 and resigned three years later to engage in consulting work.

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EMILY P. WILLIAMS, vice-president of the Williams Patent Crusher & Pulverizer Co., manufacturer, St. Louis, died suddenly at her home there at the age of 79 years. She was the widow of Milton F. Williams, founder of the business. Surviving are two sons, Arthur P. Williams, president of the company, and Oliver J. Williams.

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CHARLES F. LOWETH, who served as chief engineer for the Milwaukee Road for 25 years, died May 15 at Chicago. He was a native of Cleveland and was educated at Oberlin College. In 1926 he was honored with the degree of doctor of engineering by Rose Polytechnic Institute, Terre Haute, Ind.

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MICHAEL W. MCARDLE, president, Chicago Flexible Shaft Co., died May 17 after a long illness. He was born at Baileys Harbor, Wis., 60 years ago. Though a graduate in law, he entered the business field and had been associated with the Chicago company for 30 years.

# Code Authority of Scrap Iron Industry to Be Liquidated, Effective June 16

THE code authority for the scrap iron and steel trade has voted to liquidate its operations on June 16, and to refund the balance in its treasury to all contributing scrap iron dealers on a pro rata basis. The code authority also voted that if the Clark resolution in the Senate was finally adopted extending the NRA for approximately 10 months, that the scrap iron industry will not consent to the renewal of any code or of any labor provisions, because the exemption for "persons engaged in intrastate commerce," provided in the Clark resolution, would nullify the effect of such a code and would place an unfair burden on those dealers who happen to ship across state lines.

Benjamin Schwartz, chairman of the code authority, who recommended the liquidation, stated that the scrap iron industry had kept faith with the President by maintaining a code for the full period for which the agreement had been made, and that the code authority had tried to carry out its responsibility of enforcement, through the establishment of 16 regional boards, in face of handicaps and difficulties, caused by both conditions in the trade and administrative defects in the NRA at Washington.

However, Mr. Schwartz stated that after June 16, the present setup of administration was inoperative, unenforceable and too expensive, and would not be tolerated by the members of the industry. With reference to the continuation of a code after June 16 Mr. Schwartz recommended that if the ultimate bill passed by Congress would extend the NRA for two years and would give the power to the President to impose minimum labor codes, the scrap iron industry should continue to play its part in the recovery program by voluntarily accepting minimum labor standards.

Wallingford Steel Co., Wallingford, Conn., is having plans prepared for a new plant addition to cost, with equipment, $100,000. This plant addition will be the third one since the company was organized 11 years ago.

# The Death Blow to Bureaucracy

THE Supreme Court has spoken. By unanimous decision, it has turned thumbs down on the brain trusters and constitution "busters" who for two years have been attempting to build a super-government in America, a consolidated clan of bureaucracies having the assumed power to make and enforce our laws.

The importance of this decision goes far beyond NRA, with which it was immediately concerned. As a matter of fact, the blue eagle has been dead for months and the decision merely gives decent burial to a corpse which the Administration would have embalmed, like Lenin's body, and kept exposed to public view for two more years. Beyond the ***requiescat in pace*** which the decision pronounces over NRA, its broad and emphatic terms also sound the death knell for the Wagner labor disputes bill, the Black 30-hour week bill and all of the other pending legislative measures which are so manifestly and unconstitutionally conceived in class interest.

It is true that, in certain industries, there have been beneficial results from operating under codes, in the form of better trade practices. In such instances, however, observation shows that quality of leadership in the industry and willingness to cooperate among its members have been responsible for success. It has not been achieved through mandate of Government. But even if it had been, the price would have been exorbitant in the long run. For no measure of immediate gain can compensate when purchased at the cost of a mortgage to bureaucracy. Nor are such gains commensurate with the greater losses occasioned by the lack of confidence engendered by a trend toward State socialism.

That trend has now been definitely checked. The Supreme Court decision will go far toward restoring business confidence and to encouraging our great army of fear-frozen investment dollars to go to work. Steel and the capital goods industries will shortly feel the impetus of renewed buying that will follow the smashing of the strange gods and brazen images of a regimented economy and a philosophy of scarcity. The Schechter chicken has broken the American goose step.

Industry now has an opportunity to demonstrate its fitness for self-government. But obligations go with this charter of freedom, the obligation to preserve high standards of trade and business practice and to refrain from labor exploitation in hours and wages. Voluntary association to this end, under the code of the Golden Rule, is not prohibited by the Supreme Court decision and it will take us much further than laws merchant and hosts of blue eagles.

J. H. Van Deventer

# Supreme Court Annihilates NRA in Unanimous Decision

WASHINGTON, May 28.—Swept aside by the annihilating and unanimous decision of the Supreme Court yesterday, NRA exists today only by sufferance of business and industry. For codes are nothing more than voluntary agencies. They are no longer law merchants of the land. They have no legal force back of them. The almost two years' experience in Government regimentation has left only a shell and the Blue Eagle indeed has become a dodo.

Washington is clearly nervous over the oncoming reaction. That explains the statement issued last night by Chairman Donald Richberg of NIRB, after a long conference at the White House with President Roosevelt. Participating in the conference were Attorney General Cummings and Solicitor General Reed.

Richberg, greatly disappointed over the Supreme Court's sharp rebuff of NRA, but yielding to its powerful voice, announced suspension of compulsory enforcement of all codes. Thus wages, hours, prices, fair trade practices and other fundamental principles of codification are dependent solely upon what business and industry do about them. They can stick to them or they can entirely abandon them. Washington fears the latter step would mean great confusion in the industrial fabric of the country. Organized labor, deeply agitated over the Supreme Court decision, is meeting here today to see what legislative action it may urge to prevent what it fears may be a breakdown of wage and hour scales.

In such well-organized industries as steel the NIRB is placing much hope that collapse of fair competition will be averted. Meanwhile the Administration, together with congressional leaders, is preparing a vastly modified bill to replace NIRA.

That dependence is being placed upon industry to keep together the price and competitive structure built up by NRA is evident from the statement issued by Mr. Richberg. NRA will continue in its present form till June 16, but with no power of code enforcement.

Immediately the plans for salvaging NRA by drastic modification of the Administration bill were begun at a meeting of the House Committee on Ways and Means which was prepared to introduce the original bill in the House today and to rush it to passage. It was then hoped that the Senate would accede to the House or the Administration bill and extend NRA for 21 months.

### Confusion Likely

To the iron and steel industry, as well as to industry and business generally, the decision excited fear of a collapse of wage and hour provisions and prices filed with code authorities, for it brought down the entire structure. It was held to be altogether possible that codes, together with code authorities, in large numbers, would disappear almost immediately. Fear was felt especially that this will mean great confusion and even serious trouble through a break in prices and wages. Organized labor was especially concerned over the latter issue.

There was also much speculation as to what effect the decision may have on the pending Wagner labor disputes act and social security legislation which was on the eve of enactment. There were conflicting views as to what effect the decision would have on such legislation. It forced increased pressure on the part of organized labor for enactment of the Wagner bill and the 30-hr. work week bill. While it is held that the decision might prove the basis for knocking out legislation of this sort, evidently organized labor was driving for it in the hope that the test in court would be withheld for some time.

### Fundamentals of NRA Broken Down

The NRA decision, based on the well-known Schechter poultry case, hit at the very fundamentals of NRA and even at many of the more detailed aspects of its structure. In view of this, it was realized that any NRA legislation which Congress attempts to pass will be drastically modified as compared with the existing set-up, which will go out of existence June 16.

The decision, read by Chief Justice Hughes, and supplemented by a concurring decision by Justice Cardozo and Justice Stone, unanimously held that Congress exceeded its authority in delegating power to the President to proclaim codes and to fix wages. It brought the Blue Eagle to earth like a plummet and with it its 557 codes.

It was immediately suggested that codes might be framed through legislative action which would cover only interstate commerce, for the court hit hard at power which was held to have sought unconstitutionally to control intrastate commerce. It was clear that if wages and hours are thrown into the discard labor no longer would be interested in codes. Nor would a large cross-section of industry, which has held that these provisions in themselves proved the strongest single force in maintaining fair competition.

It was also a question as to how the Congress might provide for codes that would not be subject to the anti-trust laws. Yet it was thought possible that in order to meet the exacting requirements of the decision, Congress might set up rather specific provisions for codifying industry which would constitute standards for the guidance of the President. The Supreme Court said that Congress had not provided sufficient restrictions and had not laid down proper rules to guide the President in approving codes. This was also in line with the recent oil decision.

### Harrison Still Hopeful

Senator Pat Harrison, chairman of the Finance Committee, conceding that in view of the Supreme Court decision NRA was "limping," said that he thought the law could and should be changed in order to comply with interstate commerce. He said the decision "great-

ly clarified" the situation and ought to remove doubts heretofore existing and thus provide Congress with a better understanding as to how to proceed with legislation to extend the act. He said that while every code that has been approved appears to be affected by the decision, he did not believe it meant the destruction of NRA.

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## German Tool Exports to United States Lower

German exports of tools to the United States registered a marked decline during the past year compared with 1933, according to a report from Vice-Consul James H. Wright, Cologne. Total shipments to the American market declined from 1073 metric tons, valued at 2,400,000 reichsmarks, in 1933, to 401 metric tons, valued at 1,014,000 reichsmarks, in 1934. Among items showing important declines were measuring instruments, wrenches, hand vices, reamers, milling machine tools and pliers, the report states. With the exception of the United States, Germany's export trade in tools was fairly well maintained in the year under review, total shipments amounting to 16,387 metric tons, valued at 40,044,000 reichsmarks, in 1934 against 16,818 metric tons, valued at 45,334,000 reichsmarks, in the preceding year.

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## Will Investigate Manganese Situation

Congressional investigation of the domestic manganese situation, including the proposed 50 per cent reduction in the manganese ore duty under the Brazilian trade agreement, and the source of the State Department's information on manganese, has been asked for by manganese producers in a letter from J. Carson Adkerson, president of the American Manganese Producers Association, to Senator James E. Murray, chairman of the special manganese committee of Senate and House members. The investigation is asked through proper authorization of the special manganese committee or the special committee on investigation of the munitions industry.

"The full facts of the manganese industry and its importance in national defense have not been properly considered by the State Department," Mr. Adkerson claims. "Manganese producers recommend that the President be asked to withhold final ratification on proclamation of the Brazilian trade agreement until the facts are determined.

"Steel companies consistently, over a period of years, refused to buy domestic manganese ores and paid an average of $4.10 per ton more for foreign manganese ore than for domestic ores of similar or higher grade. The purpose behind this was to suppress domestic production and bring about a reduction in the manganese ore duty, such as is now being negotiated through the State Department."

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## Argentine Iron and Steel Imports Up

The improved industrial situation of Argentina during the past year was reflected in a notable increase in imports into that country of iron and steel products, according to Assistant Trade Commissioner D. G. Clark, Buenos Aires. Imports of such products during 1934 amounted to 558,680 metric tons, compared with 457,014 metric tons imported in 1933, an increase of 22 per cent. The values in paper pesos, based upon customs valuations, were, respectively, 102,799,367 pesos for 1934, and 89,013,661 pesos for 1933, an improvement of 15½ per cent, the report states.

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## PWA Funds for Danville, Va., Plant

A loan and grant of $2,750,000 to Danville, Va., for construction of a hydro-electric plant, on the Dan River, about 60 miles west of Danville, has been announced by Public Works Administrator Harold L. Ickes. The plant will comprise two dams and a power house, with a transmission line running into Danville. An allotment of $3,000,000 was made for this project Oct. 16, 1933, but was rescinded March 7, 1934, after it had been defeated at an election. Since then plans for the project have been modified in some respects to permit construction at a lower cost.

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## Senate Kites Naval Appropriation

Carrying a total of $459,606,846, an increase of $11,690,000 over the House measure, the Senate naval appropriation bill, passed last Friday, sets an all-time high figure for peace-time. Backed by the Navy Department, it was predicted that but little change, if any, would be made in the Senate bill in conference. The bill provides for the laying of 24 new keels next year, the ships to cost about $197,427,000 and involving some 46,000 tons of steel. They include two cruisers, one airplane carrier, 15 destroyers, and six submarines. Ships already under construction also will be completed through funds from the appropriation. The Senate adopted an amendment offered by Senator Vandenberg of Michigan requiring shipbuilders to submit to the Navy Department full estimates on which they base their bids for the construction of the new vessels.

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## Works Applications Announced

Announcement has been made by the Division of Applications and Information of applications for allotment funds for Federal projects which have been filed by Government departments and independent agencies. They are requests for money to carry out various improvements on Government properties throughout the country. The applications are now in the earliest preliminary stage of consideration. They will be reviewed and examined by the division to see if they come within the President's fundamental principles, according to a statement of the division, and particularly in relation to the unemployment areas which the proposals might affect. They have been sent to the Works Progress Administration in order that before further consideration, potential employment possibilities may be checked against the number actually unemployed within the areas in which such projects might be carried out.

Among the applications are the following: Smithsonian Institution, Washington, construction of two wings on Natural History building, $6,490,000; Army base, Washington, construction of building, $2,635,373; addition to Army hospital, St. Petersburg, Fla., $1,300,000; construction of buildings, War Department, Columbus, Ohio, $1,272,242; additional buildings at National Soldiers' Home, Marion, Ind., $1,025,000; construction of building, Army base, El Paso, Tex., $2,101,645.

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## Terms for Non-Federal Projects Liberalized

With approval given by the President, the Advisory Committee on Allotments has liberalized its loan and grant terms on non-Federal projects carried on by the PWA under the $4,000,000,000 Emergency Relief Appropriation act by reducing the rate of interest to 3 per cent and fixing the grant at 45 per cent of the cost of the project. The Federal Emergency Administrator of Public Works was given discretionary authority to recommend to the committee a variation in the amount of the grant.

Non-Federal PWA projects under the old PWA procedure were offered an outright grant of approximately 30 per cent of the cost

and a loan of the balance of the cost at a rate of 4 per cent. Falling interest rates, it was stated, subsequently made it possible for PWA to sell, at a substantial profit, $85,000,000 worth of bonds it received and more such bonds will be sold as they become available. Liberalization of the grant and reduction of the annual interest, the committee said, is designed to open the way for non-Federal bodies to cooperate in the works relief program with the Federal Government on a more generous basis and achieve the reemployment objectives.

"Such action is designed to make it easier for the communities to borrow funds on collateral security from PWA instead of requesting outright all-Federal grants, thus helping to carry the President's objective of seeing as large a portion as possible of the funds returned to the treasury," the statement said.

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### Kendall Clamps Down on Publicity

H. P. Kendall, chairman of the Business Advisory Council for the Department of Commerce, denying published reports of disagreement between the President and the council, issued a statement last week clamping down on publicity of its reports or opinions. Stating that no reports of the committee chairmen have been withheld from publication by any one in the Administration, as had been alleged, the council adopted a resolution that no publicity of its reports or opinions be given out on its part. The resolution also asked "that similar absence of publicity be observed by all officers of the Government and others to whom its reports or opinions shall have been communicated."

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### Industrialists Ask Two-Year NRA Extension

Meeting in Washington last Wednesday, approximately 1500 business men and industrialists representing some 150 coded industries, adopted resolutions recommending a two-year extension of NRA. The meeting was called by the Industry and Business Committee for NRA Extension, headed by Ward Cheney, silk manufacturer. In a fleet of taxis about half of the delegates went to the Capitol and called upon representatives and senators, but were unable to get audiences with Senators Borah, Nye and King, vigorous opponents of NRA. Chairman Cheney said the delegates intended no spectacular "show," planned no "march" and attempted nothing of the circus type of demonstration. The meeting, however, was considered to have been unfortunately timed inasmuch as it was held on the day the President read his bonus veto to Congress and this occupied the principal attention of members of both the House and the Senate. Among those attending the meeting were the following: Col. Merrill G. Baker, Steel Founders' Society of America, New York; Edward Ehrbar, Edward Ehrbar, Inc., construction machinery, New York; Oscar A. Brown, Carlson Hoist Machinery Co., Brooklyn; M. H. Rothchild, Complete Machinery Co., New York; Edward A. White, United Hoisting Co., New York; Glynne Morris, Commissioner, Alloy Casting Association, Inc., New York; H. H. Harris, General Alloys Co., Boston.

# Opponents of Beaver-Mahoning Canal Voice Objections at Washington

WASHINGTON, May 28.—Opposition to construction of the proposed canal from Beaver, Pa., to Struthers, Ohio, was voiced last week before the Senate Committee on Commerce by representatives of the Upper Ohio Valley Association. The association is composed of a group of about 150 manufacturers, steel companies, coal companies and railroads, including representatives from most of the industrial centers from Johnstown, Pa., to Columbus, Ohio, and from Erie, Pa., to Portsmouth, Ohio.

The spokesman for the steel companies was L. F. Rains, president of the association and of the A. M. Byers Steel Co., Pittsburgh. Attorney John J. Heard, Pittsburgh, spoke for the association as a whole. Decision as to whether the canal will be constructed is expected to be made by the Senate Committee on Commerce of which Senator Copeland, New York, who sat at the hearing together with six other senators, including Senator Guffey of Pennsylvania and Senator Donahey of Ohio.

It was stated that assurance has been received by the Ohio Valley Association from Frank C. Walker, chief of the Division of Application and Information for the works relief program that the allotment of $5,000,000 to start work on the canal would not be approved nor disapproved until after the hearing before the committee.

Opponents of the project argued that its construction is out of harmony with the public policy of the United States on the improvement of inland waterways as reflected in the statutes and the rules of the War Department. It was contended that the policy always has been that public money should not be applied except where the improvements serve the general commercial and navigation interests of the United States as a whole and only where the project promises to effect a substantial saving in the cost of transportation, inclusive of fixed charges and the cost of operation and maintenance of the waterway, as well as the cost of boat service.

The committee was told that the project, terminating at Struthers, five miles from Youngstown, would benefit the Youngstown district exclusively. It was also contended that the cost of the canal would be $71,800,000 as against $47,000,000 as estimated by the Army engineers, based on an estimate of $37,000,000 to dig the canal and $10,000,000 for damages to the territory it traverses. It was declared by the opponents that these estimates omitted the cost of terminal facilities, fixed at $3,500,000; under-estimated the cost of adjusting highways and railroads to the waterway in the amount of $14,775,000 and omitted interest during construction, fixed at $6,525,000. Addition of these items, it was said, would bring the total cost to $71,800,000, without an additional reservoir which was said to cost about $4,000,000 "and a probably great under-estimate of the cost of lands and damages." It was also maintained that the waterway would be closed to traffic by ice, wind, fog and high water 65 days during the year, during which the traffic would have to be transported by rail.

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Chase Brass & Copper Co., Waterbury, Conn., manufacturer of non-ferrous metals and products; Hays Corpn., Michigan City, Ind., manufacturer of gages, recorders, thermometers, furnace coverings, etc.; Jones & Laughlin Steel Corpn., Pittsburgh, manufacturer of a complete line of steel products; Revere Copper & Brass, Inc., copper and brass rolling mills and fabricator; and Toledo Scale Co., Toledo, Ohio, manufacturer of scales and precision instruments, have become members of the Exhibitors Advisory Council, Inc., New York., an exhibit service organization which issues information on industrial and trade shows.

# Court Ruling Will Affect Trade Favorably, Leaders Believe

THE decision of the United States Supreme Court invalidating the National Industrial Recovery Act came so unexpectedly that most industrial leaders, at the time of putting THE IRON AGE to press, were unwilling to make extended comments on the probable effects on business. Most of those who were willing to go on record, however, expressed the hope that wage and hour standards would remain undisturbed, and believed that the implied unconstitutionality of the Wagner bill and other pending legislation removed the most serious obstacles to healthy business recovery.

The following telegrams received from Ralph E. Flanders, president, Jones & Lamson Machine Co., and C. G. Conley, head of the American Institute of Steel Construction, give a good cross-section of the reaction of business leaders to the court decision.

### *Ralph E. Flanders Sees Business Stimulated*

THE Supreme Court decision must have come as a startling surprise to many, though in retrospect it is seen to have been inevitable. A most satisfactory feature is that it was unanimous. The questions involved are settled beyond doubt.

Other things being equal, the effect on recovery should be favorable. The paralyzing fear of further Governmental encroachment will be lifted and private enterprise will be warranted in taking the new risks involved in expanding business activity and employment. The principal danger from business lies in the possibility that some shortsighted employers may begin cutting minimum hourly rates, which would lead to serious labor troubles. If this can be avoided employment should improve. On an increasing volume of business destructive price cutting should not be a serious danger, so that this element of code protection will not be missed.

This event opens up an unexpected and unparalleled opportunity for business to exercise constructive statesmanship. Business alone has the power to raise and steady the standard of living of the American people. If the existing and established nationwide business organizations are ready to develop and exercise this needed statesmanship, they can place themselves in a well deserved leadership of the nation, drawing to their support the needed cooperation of finance and agriculture and of whatever Government may chance to be in power.

RALPH E. FLANDERS,
*President, Jones & Lamson Machine Co., Springfield, Vt.*

### *Decision to Best Interests of Nation, Says C. G. Conley*

IT seems to me that the Supreme Court decision means that the uncertainty of business is at last on the way to being cleared up, and it would seem to be in the best interest of the country that employers should not take advantage of the decision and make changes in hours and wages. The decision should be deemed a notice to Congress that the proposed Wagner bill is clearly unconstitutional.

C. G. CONLEY,
*Mount Vernon Bridge Co., Mount Vernon, Ohio*

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WASHINGTON, May 28.—Fifteen Detroit architects have been chosen to prepare plans for a slum clearance project in Detroit which will cost $6,000,000 and will be financed by PWA funds.

IF the spring won't go under the high part of this gage block, or if it will go under the low part, it is respectively too long or too short. At the Chevrolet Detroit plant, where knee-action units are built complete, workers pick the completed springs off conveyor hooks as they ride by the testing stations, and only those that pass this and other inspections reach the assembly line.

# Coal Strike Looms as Wage Conference Breaks Down

WASHINGTON, May 28.—Following a complete breakdown here this afternoon of wage conferences between bituminous coal operators and miners in the Appalachian field, President John L. Lewis of the United Mine Workers announced that no coal would be mined in that field after June 16. It is expected that miners in other sections of the country will also walk out on that day. Lewis said maintenance men would be kept at the mines.

The annual wage agreement with union mine workers was extended to June 16 through negotiations with the NRA from April 30, after operators had declined to accept union demands for higher wages and shorter hours. It was hoped that NRA would be extended beyond June 16 and through continuance of price fixing some settlement could be reached between operators and miners. But with the Supreme Court invalidating NRA, this hope disappeared and operators maintained that without assurance of a stabilized price structure they could not accept union demands either in part or entirely.

The breakdown of the conference developed after the union officials with a group of coal operators disagreed with operators over the Guffey bill, which the latter oppose while the former favor. For this reason the threatened walkout was looked upon in some quarters as being a gesture intended to force a modified Guffey bill through the present session of Congress.

## New Chemical Company Is Organized

THE Cliffs-Dow Chemical Co. has been organized by the Cleveland-Cliffs Iron Co., Cleveland, and the Dow Chemical Co., Midland, Mich., to manufacture chemicals derived from wood. The Cleveland-Cliffs company has operated a chemical plant at Marquette, Mich., for 20 years and this plant, including 195 acres of timber land, will be turned over to the new company. Both the Cleveland-Cliffs and the Dow companies have been conducting research work for the manufacture of chemicals from timber. The new company has been incorporated at Lansing Mich., with an authorized capital of $2,500,000 of A preferred, 10,000 shares of B preferred and 25,000 shares of common stock.

William Dow, president of the Dow company, and E. B. Greene, president of the Cleveland-Cliffs company, have been elected president and vice-president, respectively, of the new company. E. W. Bennett of the Dow company is treasurer and V. P. Geffine, vice-president and controller of the Cleveland-Cliffs company, is secretary. E. T. Olson, manager of the Cleveland-Cliffs present chemical plant, will be general manager. The directors include William G. Mather, chairman of the board, Mr. Greene, A. C. Brown, vice-president, and Mr. Geffine, representing the Cleveland-Cliffs executive personnel, and Mr. Olson. Representatives of the Dow company on the board are Mr. Dow, M. E. Putnam, E. W. Bennett, L. I. Doan and C. J Strosacker. The Cliffs-Dow headquarters will be at Marquette, Mich.

## Blast Furnaces Used Much Raw Material

IF all the raw materials consumed during 1934 in the manufacture of pig iron had been hauled by the railroads at one time, 1,000,000 freight cars—half of the total number of all types of freight cars in the United States—would have been loaded to capacity, the American Iron and Steel Institute has estimated.

Nearly 49,000,000 gross tons of iron ore, coke, limestone, mill scale, cinder and scrap were charged into pig iron producing blast furnaces last year. More than 26,000,000 tons of this total consisted of ore; almost 14,000,000 tons was coke; over 5,500,000 tons was limestone. Cinder, mill scale, scrap and other materials made up the balance. In addition to these solid materials, about 63,000,000 tons of air previously heated in hot-blast stoves was blown through the blast furnaces during the year.

Approximately 157,000,000 man hours of labor—equivalent to a full year's work for more than 100,000 men—was required last year to mine the iron ore, coal and limestone, to convert the coal into coke and finally to produce pig iron.

Manufacture of one ton of pig iron, it is estimated, requires about four tons of air, 1 2/3 tons of iron ore, almost one ton of coke, one-third of a ton of limestone, and about one-quarter of a ton of scrap, mill scale and cinder.

## Tin Trade Association Opposes Tax

THE American Tin Trade Association has called to the attention of its members the McReynolds bill (H. R. 7675), introduced in the House of Representatives by the Chairman of the Foreign Affairs Committee, providing among other things for the assessment of a processing tax of 6c. a lb. on all imported metallic tin. The association points out that the total production of tin in the United States and Alaska during the last 30 years was less than 1200 tons, of which only a few tons were mined in the United States; whereas American imports of metallic tin during the same period were 1,636,000 tons. The American Tin Trade Association is not opposed to the establishment of an American tin smelting industry, but questions the availability of ore supplies, and points to the lack of evidence of any American tin deposits of consequence.

The association reminds its members that for many years all tariff acts have provided for an import duty whenever the United States is mining tin at the rate of 1500 tons (metallic) per annum. Under the present proposal the total tax on imported metallic tin might be as much as 12c. a lb.

The association's statement goes on to say that the tax would not be a heavy price to pay for tin independence, but it seriously doubts that the United States, lacking domestic tin deposits, can so purchase such independence.

## Industrial Ad Men to Meet at Pittsburgh

THE convention of the National Industrial Advertising Association at Pittsburgh, Sept. 18 to 20, will present a balanced program, designed to bridge the gap between 1929 and 1935, which marked the era of industrial lassitude, depleted appropriations and changing organizations.

# German Steel Output Still Rising—Bridge Construction Very Active

HAMBURG, May 13 *(By Special Correspondence)*.—Steel production in Germany is showing a further rise. Steel works still have plenty of orders on their books, and on many products, such as hoops, mills are so well engaged that they are refusing to accept export orders. It is anticipated that monthly steel production in the near future will average more than 1,300,000 tons.

Bridge construction in Germany is entering a new stage. Since 1933 the number of bridges under construction has quadrupled. At present, not less than four bridges are under construction across the Rhine and three across the Elbe. Most of the bridges are for motor car traffic. The construction of thousands of kilometers of roads in Germany also requires hundreds of small or large bridges.

For all bridges in Germany high tensile and high breaking limit steel ST 52 is used. Most of the bridges are of caterpillar construction, as for example, the Maxau bridge across the Rhine which has two caterpillar spans. The steel employed is copper and corrosion-resistant. By employing ST 52 steel it is possible to reduce the weight sharply. For example, only 3920 tons of construction steel has been used for the new bridge across the Rhine at Neuwied instead of 4870 tons which otherwise would have been required.

Large German steel works have been able to build up heavy reserves during the last 20 months. The Mannesmann Tube Works alone has not resumed dividends. Makers have been able to add to their reserves between 15 and 30 million marks during one year after doubling write-offs.

The Anglo-continental agreement concerning regulation of prices for steel and imports into Great Britain and extension of the ship plate and steel rail cartel have had little influence upon the German steel export trade. In German circles it is generally believed that this agreement will be also extended to include allotments for export to the British dominions and colonies, particularly India. No advance of prices, however, can be anticipated in the coming weeks. General export demand is a little brighter, particularly from the Far East and Latin America. The Belgian industry is getting better business from domestic sources and is at the moment less interested in starting any serious competition.

Stainless steel prices continue to decline. This foreshadows the expiration of the Krupp-Brearley stainless steel patents next year. The price for stainless steel was steady from 1925 to 1933 at about £100 per ton for finished products. In March, 1934, prices were reduced 8 per cent. A further reduction of 8 per cent followed in December and now a further reduction of 6 per cent has been announced. It is probable that a further 6 to 8 per cent reduction will be made this summer. The makers of cutlery and other stainless steel products demand that the prices should be lowered at least 15 to 20 per cent to increase the demand for stainless steel products.

It is possible that the keen Dutch pig iron competition will come to an end. Dutch iron is highly competitive in the United States and in other markets. The agreement with the French industry regulating prices and sales was followed by an agreement with Germany and Belgium. This will probably be extended also on general export business. Russian pig iron, which early this year appeared in increasing quantities on the markets, has disappeared. Buyers of Russian iron were said to have been disappointed at the quality.

The German motor car industry continues to show heavy turnover figures. During the first quarter, turnovers were 90 per cent better than last year and some makers are unable to cope with the demand. All stocks are low and sales of trucks were 21 per cent better than last year.

The decision of the Continental Steel Cartel to centralize orders for bars in Luxemburg and to distribute the orders by a fixed allotment plan has had no influence upon business. In trade circles it is not thought possible that this organization plan will be feasible or will lead to any change in the present business situation.

The Polish Steel Cartel is organizing export business through a new office, established at Warsaw which will appoint agents abroad or trade with merchants.

# Arthur H. Young Honored

ARTHUR H. YOUNG, vice-president in charge of industrial relations, United States Steel Corpn., was awarded the Henry Laurence Gantt memorial medal in recognition of "his outstanding and creative work in the field of industrial relations" at a meeting of the Institute of Management in the Pennsylvania Hotel, New York, May 24.

A. H. YOUNG
*Vice-President, United States Steel Corpn.*

"Industrial management," he said in his address of acceptance, "is quite capable of handling labor problems to the satisfaction of all. I hope no legislation will be passed which will make illegal a free discussion of problems between employer and employee.

"I would rather go to jail or be convicted as a felon and yet be true to the principles of peaceful cooperation in industry," he declared. "I would never accept or submit to any formula for the conduct of human relationships in industry which is an unpalatable and unrighteous and unjust technique imposed on us by demagogues."

**Spang, Chalfant & Co., Inc.**, and subsidiary company report for the first quarter net profit of $131,903 after interest, depreciation and taxes, equivalent to $1.01 a share on the preferred stock on which accumulated unpaid dividends at the end of the quarter amounted to $16.50 a share. In the first quarter of 1934 the company sustained net loss of $37,391.

## Dr. Tuckerman Will Address A. S. T. M.

L. B. TUCKERMAN, assistant chief of the Division of Mechanics and Sound of the Bureau of Standards, will deliver the tenth Edgar Marburg lecture at the 1935 annual meeting of the American Society for Testing Materials on June 26 at Detroit.

Doctor Tuckerman, who has done considerable work on technical problems pertaining to the airplane and airship fields, has chosen the subject "Aircraft: Materials and Testing." After a brief review covering the development of the structural design of modern aircraft, pointing out the controlling influence of the demand for a light-weight structure, he will discuss the relationship between mechanical properties of structural materials and the shape of the structural elements which determine the strength-weight characteristics. He plans to describe the requirements of mechanical testing of materials for use in heavily loaded light-weight structures and the structural significance of the tests.

Following a discussion of the development of two types of materials which meet the demands of light-weight metallic construction, namely, relatively high-strength light-weight alloys, and extra high-strength ferrous alloys, Dr. Tuckerman will point out the relationship of the mechanical properties of such alloys to their use in aircraft structures.

## Shortage of Skilled Labor Reported

A SHORTAGE of 1193 skilled craftsmen is reported by 287 metal manufacturing companies employing 115,260 wage earners, according to a study just completed by the National Industrial Conference Board. In the metal working industry as a whole the shortage of skilled workers is estimated at 19,034. If this industry resumes normal operations, the board points out, the shortage of skilled workers would be increased to 123,357.

Some of the important factors that have brought about this shortage of highly skilled mechanical labor are listed by the conference board as follows:

1. Tendency to develop single machine operators for special machines in place of all-around mechanics capable of operating any machine.

2. Abandonment of industrial employment by skilled craftsmen in favor of other occupations.

3. Deterioration in skill and usefulness of more mature workers through prolonged unemployment.

4. Reduction in the supply of highly skilled labor because of obsolescence and mortality at the estimated rate of 5 per cent per year, resulting in a 25 per cent loss from this cause since the beginning of the depression.

5. Inadequate apprentice training before the depression, the loss from this cause being aggravated by the suspension of many apprenticeship programs during the depression.

6. Reduction in working hours under NRA codes has made the existing supply of highly skilled mechanical labor from 20 per cent to 40 per cent less effective.

7. Code restrictions on the number of learners who can be employed at less than the minimum wage scale restricts the scope of apprentice training.

8. Industry's inability, because of business uncertainty, to assure continued employment influences mechanics on relief to refuse jobs which may be temporary, because of the difficulty in obtaining reinstatement on relief rolls after leaving them.

9. Government enterprises, such as navy yards and public works projects, have drawn from industry some of its most highly skilled labor because of industry's inability to compete with government wage scales and because of the more continuous work on government projects.

## A. S. T. M. Will Show Testing Equipment

A FEATURE of the forthcoming convention of the American Society for Testing Materials at Detroit will be extensive display of equipment by leading companies in the testing instrument and related apparatus fields. In addition, the exhibit will include non-commercial apparatus sponsored by A.S.T.M. committees or research laboratories for the carrying out of special tests and research work. In this group of displays there will be a special high-speed fatigue testing machine, a low capacity impact machine, a machine for making bending tests in wire used for mounting vacuum tube elements, apparatus used for special tests of electrical insulating materials and others.

Committee B-3 on corrosion of non-ferrous metals and alloys plans to have an extensive display of the large number of atmospheric, galvanic, electrolytic and immersed test specimens which it has collected from the various test racks throughout the country after being examined following the first cycle of exposure. The society's committee on metallography will sponsor a special display of photographs and other material in this field. Also, the new and improved apparatus used in the testing of petroleum, cement and other materials will be in operation.

## Tolerances for Cast Iron Determined

THE American Foundrymen's Association is now conducting a survey to investigate the desirability of developing schedules of tolerances for gray iron and other types of castings. If it is found that there is a need for such schedules, the association will formulate proposals and present them to the members for criticism prior to adoption. No such standards are currently available, and engineering firms have found it difficult to specify tolerances in their buying specifications.

The tolerances for cast iron now under consideration by the association include a minimum of plus or minus 1/64 in. for castings up to 2 in., and a maximum of plus and minus 1/32 in.; for castings from 2 to 4 in., the minimum and maximum tolerances are 1/32 and 3/64 in.; for 4 to 7 in., 3/64 and 1/16 in.; for 7 to 12 in., 1/16 and 3/32 in.; for 12 to 24 in., 3/32 and ⅛ in.; for 24 to 40 in., ⅛ and 5/32 in.; for 40 to 60 in., 5/32 and 3/16 in.; for 60 to 100 in., 3/16 and ¼ in.; and for castings over 100 in., the minimum tolerance suggested is plus or minus ¼ in., and the maximum is plus or minus ½ in.

Completing the concentration of its industrial materials division at Newark, Ohio, the Owens-Illinois Glass Co., Toledo, Ohio, has recently moved the sales department of this division from Toledo to the Newark plant. This plant is devoted entirely to the production of Dustop replacement type air filters, insulating wool, glass silk and other industrial glass products. Research and engineering, as well as production, are now carried on at the Newark plant, and the sales headquarters has been located there to insure close coordination of all activities and best possible service to customers. Garland Lufkin, formerly manager of the Owens-Illinois factory at Bridgeton, N. J., is now in charge of the entire operation of the industrial materials division. J. S. Irvine continues as sales manager.

## 1935 S.A.E. Handbook

NEW material in the 1935 S.A.E. Handbook includes a complete revision of the Iron and Steel Specifications and the Nonferrous Metals Specifications, succeeding the latest previous specifications of 1922. Revised tables of screw threads and bolts and nuts are given as American Standard under the sponsorship of the S.A.E. and the A.S.M.E.

For the automotive industry cost classifications for motor-vehicle fleet operations, standardized lubrication data, spark plug specifications, revised headlamp information and storage battery specifications are all brought up to date. The complete report of the automotive transportation code committee is published in connecton with regulatory and similar matters.

Copies are available from the Society of Automotive Engineers, Inc., 29 West Thirty-ninth Street, New York.

## Scrap Buoyant At Detroit

DETROIT, May 28. — Although consumers are showing little interest in scrap buying, the market is being sustained well on account of speculative purchases by local dealers. June scrap lists of automobile companies are now out for bids, the Chrysler list closing in the next day or two. It is expected that the prices brought by various items on these lists will determine the market trend for the next few weeks. Meanwhile prices are unchanged from a week ago.

## This Week on The Assembly Line

(CONTINUED FROM PAGE 49)

show which is scheduled for Nov. 2-9. Sales executives, traditionally optimistic, are excited about the long-range outlook. One prominent sales manager sees a 5,000,000-car year not far off; in fact, he thinks it may come next year. There is increasing talk about the growing number of two-car families. Some of these predictions may be attributed to the blowing off of excess sales steam. On the other hand, it is of significance as an indication of the confidence with which the industry is viewing the future.

The "Monitor Sealed Motor" of the new Nash has no exposed manifolding, the intake being cored in the water-cooled head and the exhaust in the side of the block. The oil manifold is cored in the lower end of the crankcase. Each rear side quarter of the body and side roof crown panel as far forward as the center door pillar is a one-piece stamping. The top of the cowl, windshield pillars and forward portion of the roof as far back as the center door pillar, are formed in one stamping. The rear half of the top and the entire back panel of the body make up another huge stamping.

### Detroit Notes

The RFC has granted a loan of $1,000,000 to Continental Motors Corpn. . . . The fight is on again in Hupp between the Andrews-Drake factions. . . . The strike at Packard came to an abrupt end last week. . . . Chrysler is introducing a line of De Luxe Airstream cars. . . . The Chevrolet foundry at Saginaw has purchased two cargoes of pig iron from a merchant producer at Buffalo. It is the first iron bought since General Motors made an agreement more than a year ago to take a large tonnage of iron from a Cleveland steel company. . . . Hudson sold 38.4 per cent of all the cars delivered at retail by independent makers during the first quarter.

## Trade Notes

**Harrisburg Pipe & Pipe Bending Co.**, Harrisburg, Pa., has changed name to Harrisburg Steel Corpn., according to Wilbert Wear, president and treasurer. The sole purpose in adopting the new corporate title is to make the firm name more accurately represent the operations and products of the company. No changes in corporate set-up or in personnel at the plant or in the field were made.

**Bliss & Laughlin, Inc.**, manufacturer of cold-finished bar steels and shafting, with mills at Harvey, Ill., and Buffalo, has appointed G. G. McDonald as sales representative covering Arkansas, Oklahoma, Texas and boundary cities of Texas and Louisiana. The district office will be located at 3502 Rosedale Street, Dallas, Tex.

**R. K. LeBlond Machine Tool Co.**, Cincinnati, has established direct sales office in Chicago, covering Western territory under direction of B. N. Brockman, Western sales manager, 20 North Wacker Drive, Chicago.

**Wilson-Marren Co.**, 123-125 North Third Street, Philadelphia, has been established to deal in new and used machinery, motors, pumps, etc.

**Midvale Steel Products Co.**, New York, has moved its offices from 32 Broadway, to 50 Church Street.

**Chicago Bridge & Iron Works**, Chicago, has completed license agreement with the Compagnia Tecnica Industrie Petroli S.A.I., Milan, Italy, covering the sale, manufacture and erection of Wiggins floating roofs and Wiggins breather roofs for oil storage tanks in Italy. Other firms licensed to manufacture Wiggins roofs in foreign countries are: the Horton Steel Works, Ltd., Fort Erie, Ont.; Motherwell Bridge & Engineering Co., Ltd., Motherwell, Scotland; Whessoe Foundry & Engineering Co., Ltd., Darlington, England; Worms & Cie., LeTrait, France; and Asano Bussan Co., Ltd., Tokyo, Japan.

**Louis Allis Co.**, Milwaukee, manufacturer of electric motors, has appointed Harris-Green Co., 1101 Farmers Bank Building, Pittsburgh, as engineering-sales representatives in western Pennsylvania.

**Construction Equipment Co.**, 2274 Main Street, Hartford, Conn., has been appointed authorized distributer by Link-Belt Co., Chicago, shovel and crane division.

**Plates.**—Lukens Steel Co., Coatesville, Pa.—Card showing sizes of rectangular and circular plates produced by company. Extreme sizes rolled on company's 206-in. plate mill are shown in red. Attention is called to availability of plates up to 25 in. in thickness for bridge and building bases, die work, fly wheels for welded steel structures for machinery and equipment and other purposes.

## Financial Notes

**Chain Belt Co.**, Milwaukee, reports sales for the current year as being approximately 20 per cent ahead of last year with unfilled orders showing an even greater improvement. For the year ended Dec. 31, 1934, the company had net income of $209,987, compared with losses of $106,234 and $345,720 respectively in 1933 and 1932.

The $25,000,000 financing program of the **American Rolling Mill Co.** was approved on May 16, at the annual stockholders' meeting, at Middletown, Ohio. Approximately $4,500,000 of this amount will be used to construct a wide sheet mill and some miscellaneous equipment; about $1,500,000 will be used for additional working capital, while the remainder will be devoted to retiring outstanding convertible 5 per cent bonds of 1938 and $3,500,000 5½ per cent bonds of the Sheffield Steel Corpn., a subsidiary.

**Wheeling Steel Corpn.** and subsidiary companies, in the quarter ended March 31, 1935, had net profit after all charges of $934,571. This compares with a net loss of $58,333 in the like 1934 period.

**The Granite City Steel Co.**, Granite City, Ill., earned $134,581 in the first quarter of this year, as against a net loss of $18,441 in the first quarter of 1934.

**The Blaw-Knox Co.**, Blawnox, Pa., in the first quarter of 1935, had net profit of approximately $142,000, after depreciation and estimated taxes, exclusive of its foreign subsidiaries. This compares with loss of $5,272 after similar charges in the first quarter of 1934. Increased sales of industrial equipment led to the improved showing, according to Irvin F. Lehman, president.

# Current Metal Working Activity Statistically Shown

These Data Are Assembled By THE IRON AGE From Recognized Sources And Are Changed Regularly As More Recent Figures Are Made Available. Boldface Type Indicates Changes This Week

| | April, 1935 | March, 1935 | April, 1934 | Four Months, 1934 | Four Months, 1935 |
|---|---|---|---|---|---|
| **Raw Materials:** | | | | | |
| Lake ore consumption (gross tons)[a] | 2,356,391 | 2,582,986 | 2,470,121 | 8,043,736 | 9,676,171 |
| Coke production (net tons)[b] | **2,736,723** | 3,012,692 | 2,947,051 | 11,283,303 | 11,512,399 |
| **Pig Iron:** | | | | | |
| Pig iron output—monthly (gross tons)[c] | 1,663,475 | 1,770,028 | 1,726,851 | 5,825,284 | 6,519,391 |
| Pig iron output—daily (gross tons)[c] | 55,449 | 57,098 | 57,561 | 48,544 | 54,328 |
| **Castings:** | | | | | |
| Malleable castings—production (net tons)[d] | **42,035** | 42,808 | 40,742 | 148,536 | 169,620 |
| Malleable castings—orders (net tons)[d] | **37,394** | 40,237 | 38,453 | 150,509 | 163,424 |
| Steel castings—production (net tons)[d] | ..... | 31,940 | 46,242 | 141,903 | ..... |
| Steel castings—orders (net tons)[d] | ..... | 30,723 | 63,142 | 185,182 | ..... |
| **Steel Ingots:** | | | | | |
| Steel ingot production—monthly (gross tons)[c] | 2,606,311 | 2,830,700 | 2,897,529 | 9,813,314 | 11,013,306 |
| Steel ingot production—daily (gross tons)[c] | 100,243 | 108,873 | 115,901 | 95,517 | 106,906 |
| Steel ingot production—per cent of capacity[c] | 45.28 | 49.18 | 52.64 | 44.54 | 48.30 |
| **Employment in Steel Industry:** | | | | | |
| Total employees[e] | ..... | 425,189 | 431,086 | 411,668 | ..... |
| Total payrolls (thousands of dollars)[e] | ..... | 46,764 | 45,472 | 157,038 | ..... |
| Average hours worked per week[e] | ..... | 33.9 | 34.4 | 32.9 | ..... |
| **Finished Steel:** | | | | | |
| Trackwork shipments (net tons)[e] | 4,399 | 3,440 | 6,132 | 16,699 | 13,064 |
| Sheet steel sales (net tons)[f] | **168,093** | 193,057 | 272,412 | 824,474 | 866,303 |
| Sheet steel production (net tons)[f] | **209,219** | 227,082 | 214,522 | 793,256 | 891,077 |
| Fabricated shape orders (net tons)[g] | **91,228** | 99,327 | 121,552 | 393,977 | 321,786 |
| Fabricated shape shipments (net tons)[g] | **81,271** | 82,410 | 82,194 | 253,054 | 315,266 |
| Fabricated plate orders (net tons)[d] | ..... | 16,832 | 20,085 | 89,547 | ..... |
| Reinforcing bar awards (net tons)[e] | 30,490 | 17,335 | 22,685 | 73,985 | 85,690 |
| U. S. Steel Corpn. shipments (tons)[h] | 591,728 | 668,056 | 643,009 | 1,948,495 | 2,376,976 |
| Ohio River steel shipments (net tons)[i] | **57,825** | 75,072 | 72,974 | 179,353 | 249,922 |
| **Fabricated Products:** | | | | | |
| Automobile production, U. S. and Canada[k] | **501,837** | 451,809 | 378,983 | 1,125,349 | *1,610,883 |
| Construction contracts, 37 Eastern States[l] | ..... | $123,043,500 | ..... | ..... | ..... |
| Steel barrel shipments (number)[d] | **610,848** | 525,022 | 658,216 | 2,640,579 | 1,977,132 |
| Steel furniture shipments (dollars)[d] | ..... | $1,220,533 | $934,097 | $3,780,644 | ..... |
| Steel boiler orders (sq. ft.)[d] | ..... | 655,812 | 440,562 | 1,115,729 | ..... |
| Locomotive orders (number)[m] | 2 | 8 | 40 | 63 | 11 |
| Freight car orders (number)[m] | 600 | 0 | 750 | 21,649 | 1,430 |
| Machine tool index[n] | 65.6 | 62.3 | 46.5 | †48.5 | †60.3 |
| Foundry equipment index[o] | 113.2 | 69.3 | 67.9 | †67.7 | †86.0 |
| **Foreign Trade:** | | | | | |
| Total iron and steel imports (gross tons)[p] | ..... | 21,409 | 26,862 | 113,315 | ..... |
| Imports of pig iron (gross tons)[p] | ..... | 2,708 | 8,253 | 51,590 | ..... |
| Imports of all rolled steel (gross tons)[p] | ..... | 11,355 | 9,184 | 29,645 | ..... |
| Total iron and steel exports (gross tons)[p] | ..... | 323,035 | 201,539 | 792,015 | ..... |
| Exports of all rolled steel (gross tons)[p] | ..... | 78,483 | 71,882 | 314,442 | ..... |
| Exports of finished steel (gross tons)[p] | ..... | 68,146 | 68,785 | 296,179 | ..... |
| Exports of scrap (gross tons)[p] | ..... | 232,967 | 126,687 | 463,008 | ..... |
| **British Production:** | | | | | |
| British pig iron production (gross tons)[r] | 526,300 | 553,200 | 496,300 | 1,855,600 | 2,083,800 |
| British steel ingot production (gross tons)[r] | 808,700 | 841,900 | 716,800 | 2,969,800 | 3,177,900 |
| **Non-Ferrous Metals:** | | | | | |
| Lead production (net tons)[s] | **32,389** | 32,558 | 32,113 | 140,534 | 121,756 |
| Lead shipments (net tons)[s] | **40,922** | 28,960 | 30,673 | 120,683 | 136,100 |
| Zinc production (net tons)[t] | 35,334 | 36,667 | 30,686 | 127,904 | 140,713 |
| Zinc shipments (net tons)[t] | 38,460 | 41,137 | 32,072 | 124,090 | 150,038 |
| Deliveries of tin (gross tons)[v] | 5,025 | 5,495 | 4,405 | 14,490 | 19,025 |

*Preliminary. †Three Months' Average.

Sources of figures: [a] Lake Superior Iron Ore Association; [b] Bureau of Mines; [c] THE IRON AGE; [d] Bureau of the Census; [e] American Iron and Steel Institute; [f] National Association of Flat-Rolled Steel Manufacturers; [g] American Institute of Steel Construction; [h] United States Steel Corpn.; [i] United States Engineer, Pittsburgh; [k] When preliminary, from Automobile Manufacturers Association—Final figures from Bureau of the Census; [l] F. W. Dodge Corpn.; [m] *Railway Age;* [n] National Machine Tool Builders Association; [o] Foundry Equipment Manufacturers Association; [p] Department of Commerce; [r] British Iron and Steel Federation; [s] American Bureau of Metal Statistics; [t] American Zinc Institute, Inc.; [v] New York Commodities Exchange.

# End of NRA Stuns the Iron and Steel Trade

## Uncertainty as to Future of Prices Is Offset by Belief Court Decision Will Release Dammed-Up Demand for Capital Goods

STUNNED by the Supreme Court decision wiping out the NRA and by the quick action of the Government in withdrawing legal support from the codes, the steel trade is in a state of confusion. District offices of most iron and steel producers have been instructed to continue the commercial practices outlined in the steel code and to maintain all current base quotations and extras, but it is commonly conceded that market stability from now on will depend entirely on the voluntary action of individual companies.

To what extent months of experience in code cooperation will tend to forestall a reversion to secret price cutting and harmful trade practices is, of course, unpredictable. But producers are hopeful that fear of market demoralization will serve as an effective substitute for code control in preventing a return of uneconomic prices.

THE industry's steadfastness in adhering to code standards and practices will face a severe test in coming weeks. For some time buying has been restricted to immediate needs pending continuation or termination of the steel code on June 16. Now that the legal props supporting codes have suddenly been removed by the action of the Supreme Court, steel demand has been brought almost to a complete halt.

It would be hazardous to forecast a prompt collapse of the price structure, since most producers and many consumers as well have come to place a high value on the stabilizing influence of code-sponsored wage and working standards, which would be imperiled by a price war.

Concern about maintenance of wages is offset in large part by the removal, by virtue of the Supreme Court's holding, of apprehension regarding the Wagner labor disputes bill and other pending legislation which were regarded as obstacles to long-term undertakings. If large accumulated requirements in capital goods are now released, the stimulus to demand will do much to support the wage and price structure that has been bereft of code protection.

NEVERTHELESS, present uncertainty as to the price outlook has been reflected in a wavering tone in the Pittsburgh scrap market. This nervousness, however, has not extended to other centers, and THE IRON AGE scrap composite, on the strength of a 25c. a ton increase at Chicago, has risen from $10.75 to $10.83 a gross ton, its fifth consecutive weekly advance.

ASIDE from a possible break in steel and pig iron prices, the market outlook is encouraging. Ingot production, despite the absence of forward buying and the approach of the summer season, has declined only one-half point to 42½ per cent. Recessions of one point to 43½ per cent at Chicago and four points to 68 per cent in the Wheeling district were partly offset by a two-point gain to 45 per cent in the Cleveland-Lorain area. The exceptionally even trend of operations since the first of the year has raised hopes that the sharp mid-summer slump of a year ago will not be repeated.

Automobile production, though receding, is nevertheless showing unusual staying powers. May assemblies are estimated at 400,000 units, and tentative schedules for June call for 375,000 cars. First-half output is now placed at 2,365,000 cars and trucks, a record exceeded only in 1929 and 1926.

Ample moisture in farm areas that were drought-stricken a year ago promises increased mass buying power, as well as heavier traffic for the railroads. New public works projects will begin to be placed in the latter part of June, and private building continues to show slow improvement. These factors form an excellent foundation for a genuinely active market if a broad revival in capital goods materializes.

STRUCTURAL steel lettings of 6250 tons compare with 13,800 tons in the previous week. New projects, at 28,000 tons, are the third largest this year. Total awards to date of construction steel, including structural steel, plate work, steel piling and reinforcing, are 445,720 tons, as against 503,462 tons in the corresponding period in 1934.

The Pere Marquette has bought 1000 tons of rails.

Bolt and nut discounts have been reaffirmed for third quarter. THE IRON AGE composite prices for finished steel and pig iron are unchanged at 2.124c. a lb. and $17.83 a ton respectively.

# A Comparison of Prices

## Market Prices at Date, and One Week, One Month, and One Year Previous
## Advances Over Past Week in Heavy Type, Declines in Italics

### Pig Iron

| *Per Gross Ton:* | May 28, 1935 | May 21, 1935 | Apr. 30, 1935 | May 29, 1934 |
|---|---|---|---|---|
| No. 2 fdy., Philadelphia | $20.3132 | $20.3132 | $20.26 | $20.26 |
| No. 2, Valley furnace | 18.50 | 18.50 | 18.50 | 18.50 |
| No. 2 Southern, Cin'ti | 19.13 | 19.13 | 19.13 | 19.13 |
| No. 2 Birmingham† | 14.50 | 14.50 | 14.50 | 14.50 |
| No. 2 foundry, Chicago* | 18.50 | 18.50 | 18.50 | 18.50 |
| Basic, del'd eastern Pa | 19.8132 | 19.8132 | 19.76 | 19.76 |
| Basic, Valley furnace | 18.00 | 18.00 | 18.00 | 18.00 |
| Malleable, Chicago* | 18.50 | 18.50 | 18.50 | 18.50 |
| Malleable, Valley | 18.50 | 18.50 | 18.50 | 18.50 |
| L. S. charcoal, Chicago | 24.2528 | 24.2528 | 24.2528 | 24.04 |
| Ferromanganese, seab'd carlots | 85.00 | 85.00 | 85.00 | 85.00 |

†This quotation is for delivery in South; in the North prices are 38c. a ton under delivered quotations from nearest Northern furnace.
*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

### Rails, Billets, etc.

| *Per Gross Ton:* | | | | |
|---|---|---|---|---|
| Rails, heavy, at mill | $36.37½ | $36.37½ | $36.37½ | $36.37½ |
| Light rails, Pittsburgh | 35.00 | 35.00 | 35.00 | 35.00 |
| Rerolling billets, Pittsburgh | 27.00 | 27.00 | 27.00 | 29.00 |
| Sheet bars, Pittsburgh | 28.00 | 28.00 | 28.00 | 30.00 |
| Slabs, Pittsburgh | 27.00 | 27.00 | 27.00 | 29.00 |
| Forging billets, Pittsburgh | 32.00 | 32.00 | 32.00 | 34.00 |
| Wire rods, Pittsburgh | 38.00 | 38.00 | 38.00 | 38.00 |
| | Cents | Cents | Cents | Cents |
| Skelp, grvd. steel, P'gh, lb. | 1.70 | 1.70 | 1.70 | 1.70 |

### Finished Steel

| *Per Lb.:* | Cents | Cents | Cents | Cents |
|---|---|---|---|---|
| Bars, Pittsburgh | 1.80 | 1.80 | 1.80 | 1.90 |
| Bars, Chicago | 1.85 | 1.85 | 1.85 | 1.95 |
| Bars, Cleveland | 1.85 | 1.85 | 1.85 | 1.95 |
| Bars, New York | 2.15 | 2.15 | 2.15 | 2.23 |
| Plates, Pittsburgh | 1.80 | 1.80 | 1.80 | 1.85 |
| Plates, Chicago | 1.85 | 1.85 | 1.85 | 1.90 |
| Plates, New York | 2.09 | 2.09 | 2.0926 | 2.13 |
| Structural shapes, Pittsburgh | 1.80 | 1.80 | 1.80 | 1.85 |
| Structural shapes, Chicago | 1.85 | 1.85 | 1.85 | 1.90 |
| Structural shapes, New York | 2.06¼ | 2.06¼ | 2.063175 | 2.10¼ |
| Cold-finished bars, Pittsburgh | 1.95 | 1.95 | 1.95 | 2.10 |
| Hot-rolled strips, Pittsburgh | 1.85 | 1.85 | 1.85 | 2.00 |
| Cold-rolled strips, Pittsburgh | 2.60 | 2.60 | 2.60 | 2.80 |

### Finished Steel

| *Per Lb. to Large Buyers:* | May 28, 1935 Cents | May 21, 1935 Cents | Apr. 30, 1935 Cents | May 29, 1934 Cents |
|---|---|---|---|---|
| Hot-rolled annealed sheets, No. 24, Pittsburgh | 2.40 | 2.40 | 2.40 | 2.65 |
| Hot-rolled annealed sheets, No. 24, Gary | 2.50 | 2.50 | 2.50 | 2.75 |
| Sheets, galv., No. 24, P'gh | 3.10 | 3.10 | 3.10 | 3.25 |
| Sheets, galv., No 24, Gary | 3.20 | 3.20 | 3.20 | 3.35 |
| Hot-rolled sheets, No. 10, P'gh | 1.85 | 1.85 | 1.85 | 2.00 |
| Hot-rolled sheets, No. 10, Gary | 1.95 | 1.95 | 1.95 | 2.10 |
| Wire nails, Pittsburgh | 2.60 | 2.60 | 2.60 | 2.60 |
| Wire nails, Chicago dist. mill | 2.65 | 2.65 | 2.65 | 2.65 |
| Plain wire, Pittsburgh | 2.30 | 2.30 | 2.30 | 2.30 |
| Plain wire, Chicago dist. mill | 2.35 | 2.35 | 2.35 | 2.35 |
| Barbed wire, galv., Pittsburgh | 3.00 | 3.00 | 3.00 | 3.00 |
| Barbed wire, galv., Chicago dist. mill | 3.05 | 3.05 | 3.05 | 3.05 |
| Tin plate, 100 lb. box., P'gh. | $5.25 | $5.25 | $5.25 | $5.25 |

### Scrap

| *Per Gross Ton:* | | | | |
|---|---|---|---|---|
| Heavy melting steel, P'gh | $11.75 | $11.75 | $11.50 | $12.00 |
| Heavy melting steel, Phila. | 10.50 | 10.50 | 10.00 | 10.50 |
| Heavy melting steel, Ch'go | **10.25** | 10.00 | 9.75 | 10.25 |
| Carwheels, Chicago | 10.50 | 10.50 | 10.50 | 10.25 |
| Carwheels, Philadelphia | 11.25 | 11.25 | 11.25 | 12.50 |
| No. 1 cast, Pittsburgh | **13.25** | 12.75 | 12.25 | 12.25 |
| No. 1 cast, Philadelphia | 11.25 | 11.25 | 11.00 | 12.25 |
| No. 1 cast, Ch'go (net ton) | 9.00 | 9.00 | 9.00 | 8.00 |
| No. 1 RR. wrot., Phila. | 10.25 | 10.25 | 10.25 | 12.25 |
| No. 1 RR. wrot., Ch'go (net) | 8.00 | 8.00 | 8.00 | 8.00 |

### Coke, Connellsville

| *Per Net Ton at Oven:* | | | | |
|---|---|---|---|---|
| Furnace coke, prompt | $3.85 | $3.85 | $3.85 | $3.85 |
| Foundry coke, prompt | 4.60 | 4.60 | 4.60 | 4.60 |

### Metals

| *Per Lb. to Large Buyers:* | Cents | Cents | Cents | Cents |
|---|---|---|---|---|
| Electrolytic copper, refinery‡ | 8.75 | 8.75 | 8.75 | 8.25 |
| Lake copper, New York‡ | 9.12½ | 9.12½ | 9.12½ | 8.62½ |
| Tin (Straits), New York | **51.75** | 51.35 | 50.75 | 53.10 |
| Zinc, East St. Louis | **4.30** | 4.25 | 4.10 | 4.30 |
| Zinc, New York | **4.67½** | 4.62½ | 4.45 | 4.65 |
| Lead, St. Louis | **4.20** | 3.95 | 3.60 | 3.85 |
| Lead, New York | **4.35** | 4.10 | 3.75 | 4.00 |
| Antimony (Asiatic), N. Y. | *12.75* | 14.25 | 14.25 | 8.25 |

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables. ‡Blue Eagle copper.

# The Iron Age Composite Prices

| | Finished Steel | Pig Iron | Steel Scrap |
|---|---|---|---|
| May 21, 1935 | 2.124c. a Lb. | $17.83 a Gross Ton | $10.83 a Gross Ton |
| One week ago | 2.124c. | 17.83 | 10.75 |
| One month ago | 2.124c. | 17.90 | 10.42 |
| One year ago | 2.199c. | 17.90 | 10.92 |
| | Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output. | Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham. | Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago. |

| | Finished Steel High | Finished Steel Low | Pig Iron High | Pig Iron Low | Steel Scrap High | Steel Scrap Low |
|---|---|---|---|---|---|---|
| 1935 | 2.124c., Jan. 3 | 2.124c., Jan. 8 | $17.90, Jan. 8 | $17.83, May 14 | $12.33, Jan. 8 | $10.33, April 23 |
| 1934 | 2.199c., April 24 | 2.008c., Jan. 2 | 17.90, May 1 | 16.90, Jan. 27 | 13.00, Mar. 13 | 9.50, Sept. 25 |
| 1933 | 2.015c., Oct. 3 | 1.867c., April 18 | 16.90, Dec. 5 | 13.56, Jan. 3 | 12.25, Aug. 8 | 6.75, Jan. 3 |
| 1932 | 1.977c., Oct. 4 | 1.926c., Feb. 2 | 14.81, Jan. 5 | 13.56, Dec. 6 | 8.50, Jan. 12 | 6.43, July 5 |
| 1931 | 2.037c., Jan. 13 | 1.945c., Dec. 29 | 15.90, Jan. 6 | 14.79, Dec. 15 | 11.33, Jan. 6 | 8.50, Dec. 29 |
| 1930 | 2.273c., Jan. 7 | 2.018c., Dec. 9 | 18.21, Jan. 7 | 15.90, Dec. 16 | 15.00, Feb. 18 | 11.25, Dec. 9 |
| 1929 | 2.317c., April 2 | 2.273c., Oct. 29 | 18.71, May 14 | 18.21, Dec. 17 | 17.58, Jan. 29 | 14.08, Dec. 3 |
| 1928 | 2.286c., Dec. 11 | 2.217c., July 17 | 18.59, Nov. 27 | 17.04, July 24 | 16.50, Dec. 31 | 13.08, July 2 |
| 1927 | 2.402c., Jan. 4 | 2.212c., Nov. 1 | 19.71, Jan. 4 | 17.54, Nov. 1 | 15.25, Jan. 11 | 13.08, Nov. 22 |

# Court Decision Halts Steel Buying in Pittsburgh

## Unsettlement Also Weakens Tone of Scrap Market — Output Unchanged Locally and in Valleys But Drops in Wheeling Area

PITTSBURGH, May 28.—Buying of finished steel has virtually been halted by the Supreme Court's decision against the legality of recovery legislation. Steel producers in this district have acted promptly to prevent any premature misinterpretation of the Supreme Court's decision as it relates to the iron and steel code and steel contracts. District offices in most instances have been requested to continue commercial practices outlined in the steel code and to maintain all current base quotations and extras. Although the probable policies to be established by the steel industry as a result of the code's overthrow are not predictable, it is the belief in some quarters here that the industry will ultimately revert to free competition. Meanwhile, pending official action to the contrary, all existing contracts are being rigidly observed.

Finished steel demand during the past week has leveled off. Orders from the automotive industry are decreasing gradually and not a great deal of additional buying is expected this quarter. Miscellaneous shipments are in sustained volume.

Tin plate production is slightly lower this week at 80 to 85 per cent. Sheet production is holding at 55 to 60 per cent, while hot-rolled strip output is a shade lower at 45 per cent. Raw steel output in the Pittsburgh district is holding steadily at 36 per cent and likewise is unchanged in the Valleys and nearby northern Ohio mills at 50 per cent. Production in the Wheeling district has dropped four points to 68 per cent.

### Pig Iron

With prices reaffirmed for third quarter delivery, consumers continue to buy sparingly for spot needs. Forward interest also is lacking among non-integrated steel mills, and basic and Bessemer buying is handled largely on a week-to-week delivery schedule. Gray iron and malleable foundry melt is falling slowly.

### Semi-Finished Steel

A drop in tin plate production at some non-integrated mills has decreased the movement of sheet bars, which also are being adversely affected by a slower movement of sheets to the automotive industry. A fair demand for wire rods continues. All semi-finished steel prices have been reaffirmed for third quarter delivery.

### Rails and Track Accessories

Small orders for miscellaneous track requirements represent the chief activity here. On June 1 standard rails for third quarter delivery will be quoted at $36.37½ a gross ton, f.o.b. mill; light rails from billets, $35, and light rails from rail steel, $34. Track spikes and tie plates will be quotable for that delivery at $2.40 and $1.90 per 100 lb. respectively.

### Bolts, Nuts and Rivets

The discount covering semi-finished hexagon nuts, S.A.E., larger than 1 in. in diameter recently was changed to 70 per cent off list. All discounts have been reaffirmed for third quarter delivery.

### Reinforcing Steel

The Allegheny County Authority, which is planning large scale public works projects for this district, has invited one or two bids, for estimating purposes only, on a tolls plaza for the Liberty Tubes and a bridge across the Monongahela River at Homestead. Fresh specifications for other projects are few, and the present quiet condition probably will continue until State road construction planned for this year is begun early this summer. The Pittsburgh quotation of 2.05c. for billet steel reinforcing in straight lengths as quoted by distributers has been reestablished for third quarter.

### Cold Finished Bars

A minor recession in automotive ordering has been offset by a slight increase in miscellaneous tonnage. Aggregate volume for May is running possibly a trace behind that for April. Tractor and farm implement manufacturers continue to be sustaining forces in this market. The present Pittsburgh base of 1.95c. a lb. will be extended for third quarter shipment.

### Plates and Shapes

New structural steel inquiries reported here are more numerous and heavier in aggregate tonnage. The principal item is for 6400 tons for the Harlem River bridge planned by the Hendrik Hudson Parkway Authority, New York. Limited bids are being taken for estimating purposes on the Liberty Tubes tolls plaza at Pittsburgh, which is expected to take 750 tons. A projected loading plant for American Oil Co., Hays, Pa., will require 200 tons. Recent structural awards have been extremely small.

The plate market, while not active, is holding its ground, with miscellaneous tonnage leading. Boiler work is a shade more active, while repairs to railroad equipment are stimulating a slightly heavier movement.

### Tubular Products

All discounts, as expected, have been reaffirmed for third quarter delivery. Orders are appearing in fairly steady volume, and most tube producers in this district are sustaining operations. Average output continues unchanged at around 40 per cent.

### Bars

Orders from the automobile industry in the past week were in slightly reduced volume, but aggregate bookings by producers in this district reflected a well-sustained volume. It is quite likely that shipments for May will exceed those for April by a fair margin. Although demands for alloy steel bars are not so insistent from the automobile industry, takings by other consumers are in good evidence.

### Wire Products

Automobile buying continues to drop, while the trend in demand from other sources is not so clearly discernible. Merchant trade is not brisk, but is holding its own. Production in this district is unchanged at 35 per cent. Bolt wire is moving steadily in small volume. Spoke wire is in reduced demand.

### Sheets

Demand is on an even keel. Orders from miscellaneous industries are broadly representative and are encouraging in that they are not dependent upon seasonal influences, which are beginning to depress de-

mand in some consuming industries. Automotive demand, while lacking snap, is steady, but no unusual buying for the remainder of second quarter is expected. Demand for railroad car roofing has improved notably. Mill schedules of the leading maker this week will be two points higher, but the average for the industry probably will remain at 55 to 60 per cent.

### Tin Plate

Full engagement of capacity at many mills continues to offset lower production rates at one or two large units, and output this week is only slightly lower at 80 to 85 per cent. With a large percentage of current production being stocked for later shipment, storage problems have become acute, and in at least one instance have adversely affected rolling schedules. New specifications are coming in intermittently, and backlogs still are meager. Prospects in ultimate consuming quarters, however, are unusually favorable and portend a fairly well sustained demand for tin plate for at least the early future.

### Strip Steel

General demand is diminishing, with the drop noticeable chiefly in automotive buying. Some producers here are counting on a fair amount of buying by motor car and parts makers for June assemblies, but there is some doubt whether such buying will materialize in the face of stocks believed to be heavy at certain automotive centers. Hot-rolled strip production this week is estimated at 45 per cent, with cold-rolled output practically in step.

### Coke and Coal

Brisk activity on the Lakes is accounting for a heavier exodus of bituminous coal from this district. Moreover, in some small industries consumption of soft coal has forged slightly ahead at this season. There seems to be little open concern about the questions to be settled on the new "coal year" wage contract, which is slated for disposition on June 16. The fact that negotiations thus far have reached a virtual stalemate has evidently had little bearing on the Pennsylvania fuel market. With foundry melt in this district tapering, the foundry coke market continues to be extremely quiet. Important demand for furnace coke is lacking.

### Scrap

Consumer interest in scrap has evaporated quickly since the decision against the NIRA. Brokers are in a quandary on the position of the scrap market and offerings at any price are not too plentiful. With the effects of the overthrow of the iron and steel code entirely conjectural, additional consumer purchases are expected to be only for imperative requirements and dealers who have been bullish are faced temporarily at least with an extremely uncertain situation. No representative consumer purchases of No. 1 heavy melting steel have been reported for the past seven days and that grade is quotably unchanged at $11.50 to $12, delivered this district. Some brokers continue to offer limited quantities of No. 1 steel at $12, delivered Pittsburgh district. Machine shop turnings are stronger. The current Baltimore & Ohio Railroad list covered 7155 tons, including 1500 tons of No. 1 steel.

## Cast Iron Pipe

**Milwaukee** has placed 1361 tons of 16, 20 and 24-in. class C with United States Pipe & Foundry Co.

**Fox Point,** Milwaukee post office, has placed 765 tons of 16-in. class C with Glamorgan Pipe & Foundry Co., Lynchburg, Va.

**Appleton, Wis.,** has placed 1500 ft. of 6-in. with Lynchburg Foundry Co. and 1000 ft. of 6 and 8 in. with United States Pipe & Foundry Co.

**Kaukauna, Wis.,** closed bids May 24 on 1000 ft. of 6-in. and 2600 ft. of 8-in. centrifugal water pipe and 100 ft. 16-in. black wrought iron pipe.

**Crandon, Wis.,** plans new sewerage and waterworks systems requiring 18,000 ft. of 4 to 8-in. water pipe.

**Westby, Wis.,** closed bids May 17 on 6424 ft. of 4 and 6-in. class C.

**Fond du Lac, Wis.,** has placed 270 tons of water pipe with United States Pipe & Foundry Co.

**Woodsboro, Tex.,** asks bids until June 3 for pipe for water system; also for elevated tank and tower, pumping equipment, etc., and sewage disposal plant. Fund of $62,000 has been secured through Federal aid. M. C. St. John, Esperson Building, Houston, Tex., is consulting engineer.

**Bogata, Tex.,** plans pipe lines for water system. Fund of $73,000 has been secured through Federal aid for this and other waterworks construction.

**Grand Rapids, Mich.,** plans purchase of pipe for water system. Cost about $16,000.

**Clinton, Mass.,** plans extensions and improvements in water pipe lines, including replacements in number of streets. Cost about $100,000. Financing is being arranged through Federal aid.

**Baltimore** plans new high-service pipe line in Belvedere Avenue for water supply, to cost about $70,000; also pipe lines in Curtis Bay district to cost about $110,000, and submerged pipe line in Curtis Creek, cost $120,000. Work will be carried out in connection with proposed waterworks expansion program to cost $6,000,000, financing to be arranged through Federal aid.

**Santa Cruz, Cal.,** plans new 16-in. pipe in Davis Street, for main water supply. Cost about $20,000.

**Cold Brook, N. Y.,** will soon take bids for about 10,000 ft. for water system. Fund of $25,000 has been arranged for this and other water supply construction. Wood, Rasbach & Forrest, Herkimer, N. Y., are consulting engineers.

**California Water Service Co.,** Bakersfield, Cal., plans about 6775 ft. of 4 to 8-in. for water system in Vendome district, adjoining city limits. Cost about $11,000.

**Perry, Mo.,** plans about five miles for water system. Bids recently received for waterworks installation have been rejected and new bids will be asked soon, including 75,000-gal. steel tank and tower, centrifugal pumping machinery and auxiliary equipment. Cost about $59,000. W. B. Rollins & Co., Railway Exchange Building, Kansas City, Mo., are consulting engineers.

**Hot Springs, N. M.,** will soon take bids for pipe for water supply and other waterworks construction. Fund of $65,000 has been secured through Federal aid. L. W. Cantelou, Albuquerque, N. M., is consulting engineer.

**Somerset, Ohio,** will take bids soon for pipe for water system; also for elevated steel tank and tower, pumping machinery and auxiliary equipment. Fund of $60,000 is available. Jennings & Lawrence, 12 North Third Street, Columbus, Ohio, are consulting engineers.

**Hempstead, Tex.,** plans water pipe lines and other waterworks equipment. Fund of $80,000 is being arranged for this and improvements in sewage system.

**Marissa, Ill.,** will soon take bids for pipe for water system and other waterworks installation. Fund of $83,000 has been arranged through Federal aid. Caldwell Engineering Co., Jacksonville, Ill., is consulting engineer.

**National Park Service** at San Francisco, has awarded 400 tons to Central Foundry Co. for use at Colorado National Monument near Grand Junction, Colo.

**Inglewood, Cal.,** has let 157 tons of 4 to 8-in. to United States Pipe & Foundry Co.

**Oakland, Cal.,** has taken bids on 3000 tons on which United States Pipe & Foundry Co. is low bidder.

**Santaquin, Utah,** has opened bids on 250 tons.

**Santa Monica, Cal.,** took bids May 28 on 158 tons of 4 and 6-in.

**Greenburgh, N. Y.,** has awarded 350 tons of 36-in. to Donaldson Iron Works, Emaus, Pa.

**R. D. Wood & Co.,** Philadelphia, is low bidder on 140 tons of 8-in. for Yonkers, N. Y.

## Railroad Equipment

**Bangor & Aroostook** is inquiring for two or three 4-8-2 type locomotives.

**South African Railways Administration** is inquiring for four 2-ft. gage Garrett type steam locomotives. Tender and specifications can be obtained from Transportation Division of Bureau of Foreign and Domestic Commerce, Washington.

**Canadian Pacific** is inquiring for 600 box cars and will enter the market for 150 refrigerator cars later.

#### RAILS AND TRACK SUPPLIES

**San Francisco** has awarded 235 tons of rails for municipal railway to Pacific Coast Steel Corpn. instead of to Columbia Steel Co. as first reported.

**Oregon-Washington Railroad & Navigation Co.,** Portland, Ore., is inquiring for 225 tons of spikes, bolts and tie plates for track relocation.

**United States Engineers** will open bids June 4 at Portland, Ore., for 667 tons of 90-lb. rails and 78 tons of angle rails for track relocation on Bonneville project.

**Pere Marquette** has placed 1000 tons of rails with Inland Steel Co.

**Grand Trunk Western** is inquiring for 2500 tons of tie plates.

# Chicago Agog Over Effects Of Supreme Court Ruling

Uncertainty Is Accentuated and Ingot Output Dips Further to 43½ Per Cent —Steel Scrap Advances

CHICAGO, May 28.—The trade is agog with speculation as to the ultimate effects of the Supreme Court's ruling on the NRA. It is still too early for individual companies to formulate policies though they realize that buyers need early assurance as to the course that will be followed. Some users have been anticipating the end, or at least extreme modification of the recovery act, and have been definitely looking and waiting for lower prices to follow. Others have been less concerned about price structures, but have wished to make certain of the true course of events before making long-time commitments. All things considered, the trade has been under a cloud for the last three to four weeks and mill operations have suffered accordingly. The court's ruling, at least for the moment, does not clarify the market atmosphere.

Backlogs all along the line have been shrinking, as buyers have restricted purchases to nearby needs. This situation is well exemplified by sheets, on which bookings have dropped to two weeks from a maximum of six weeks.

Fall terms on fencing are being announced, and order books are expected to benefit.

Labor troubles among consuming plants are a contributing factor toward lower ingot output, which has dropped one point to 43½ per cent of capacity.

In the face of all these uncertainties the scrap market has made some gain, though below the surface there are many disturbing conditions.

### Pig Iron

New buying is on a hand-to-mouth basis and, with May shipments only slightly under the volume in April, backlogs are shrinking. The melt continues to drop in automobile centers but, contrary to expectations two weeks ago, some stove foundries still have fair schedules.

### Wire Products

Fall terms on woven wire fencing were announced to the trade on Monday and sellers look for at least two or three weeks of active business. They have knowledge that distributers are still moving quantities of fencing that are large for this time of year. The manufacturing trade is steady, though orders are generally small and continue to come from widely diversified interests. Railroad purchases are spotty and in the aggregate small, notwithstanding that their actual needs, especially for fencing, are heavy. Illinois and surrounding States will benefit by more than $70,000,000 from Federal highway allotments. Half of this sum will be used for overhead crossings. Therefore potential business for highway guards, fencing and mesh are large. In the meantime these commodities remain sluggish considering that the first of June is at hand.

### Cold Rolled Strip

With the exception of demand from automobile centers all bookings are small and are being entered irregularly. Farm implement manufacturers are taking smaller quantities.

### Warehouse Business

Last week was the best so far in May, and in establishing this record it also reversed the form which is usually expected near the close of the fifth month. Warehousemen feel that a substantial volume of business is pending, especially so as a result of Government expenditures that appear to be near at hand.

### Sheets

With all prices extended for delivery in the third quarter there is no incentive for users to contract beyond actual needs. The result is that bookings are very light. In fact, backlogs, which a month or so ago ranged from four to six weeks, are now down to two weeks and they are still shrinking. Distributers are moving substantial tonnages of galvanized sheets into farm areas and this movement is now beginning to be felt by mills.

### Plates

A Chicago shop has booked 600 tons of land pipe for delivery to Fort Peck, Mont. In all other directions the plate market remains quiet. Railroad shops are centering on light work, most of which consists of air-conditioning passenger equipment. From all indications continuation of the dam program on the Mississippi River will offer the next real call for plates in tonnages. The impression is firmly fixed in the minds of steel men that oil companies have extensive needs in mill products and that they probably cannot long defer making purchases.

### Cast Iron Pipe

Milwaukee has ordered 1254 tons of pipe and 100 tons of special fittings, and Fox Point, Wis., and Appleton, Wis., have announced low bidders on a total of 1300 tons. Governmental red tape is believed by sellers to be holding back awards on many jobs on which quotations are now outstanding. A law recently passed in Illinois permits private capital to construct filter plants which may then be sold to municipalities. Chicago interests are taking advantage of this statute, and a group is forming to finance filter plants designed to serve Chicago.

### Reinforcing Bars

Awards of two large jobs, calling for over 1500 tons of bars, include a private undertaking requiring 800 tons. Road work is dragging, but plans call for round tonnages. In addition to paving and bridge work, the States of Indiana, Illinois, Wisconsin and Minnesota have extensive plans for overhead crossings. Fresh inquiries during the week were more numerous, though none was of large size. Commercial building jobs are more numerous, and bids are being taken on several small school projects.

### Structural Awards

Awards are unimpressive and except for a 4000-ton project in the State of Washington there are no exceptionally attractive inquiries. Practically all new jobs are earmarked for the expenditure of Government funds.

### Bars

Demand is running fairly steady except for a few weak spots in the farm equipment industry, where it appears that waning interest is due more to labor trouble than to lack

of desire to keep production up to recent levels. Road machinery shops are busy, with some of them on 24-hr.-a-day schedules.

### Rails

Miscellaneous orders for rails total 1500 tons, and it is reported that the Pere Marquette has closed for its requirements. Accessory orders can be closely measured by the requirements for new rails and are running at about one-half the volume of a year ago.

### Scrap

Heavy melting steel has moved to consumers in the range of $9.75 to $10.75, the latter being a sale the conditions of which do not make the price indicative of the market. However, the general price level is up 25c. a ton, although there is less buoyancy to the market than a week ago. Eastern brokers are sending out feelers to this market, and railroad scrap is being loaded at Milwaukee for boat shipment to Lake Erie. In the South trouble is being experienced in getting gondola cars for scrap movement to tidewater. Curtailed use by Chicago mills is resulting in some congestion on mill tracks.

## Sharp Curtailment Impends in South

BIRMINGHAM, May 28.—The Ensley rail mill of the Tennessee Coal, Iron & Railroad Co. is scheduled to close down shortly after June 1 and this will bring a marked curtailment in iron and steel production. At the present time, three blast furnaces and five open-hearth units are being operated at Ensley in connection with the rail mill. Last July, when rail production stopped, all other Ensley operations ceased, and it is probable that the same thing will occur either when the rail mill is shut down or a little later in June. The rail mill stoppage is for an indefinite period, as there is no early prospect of more rail tonnage.

All current steel and iron prices have been reaffirmed for the third quarter. The present base price of $14.50 for pig iron has remained unchanged since April of last year. Current bookings are mostly routine, small lots. Demand for sheets and wire products is affected by seasonal trends and also by the uncertainty as to the fate of the code. Jobbers are allowing their stocks to run low, pending action on price control.

The May pig iron movement will be slightly ahead of that for April. Pipe and stove plant consumption has been just as steady as in April, while that of general foundry trade has been a shade better.

Ten blast furnaces are active, a gain of one during the month furnished by the Woodward Iron Co., when it blew in a second merchant stack on May 8. Four of these are on foundry iron, four on basic, one on high silicon and one on recarbonizing.

Eleven open-hearths are producing, the Tennessee company having nine and Gulf States Steel Co. two.

Heavy steel products are moving slowly, depending on the award of current business. The outlook for the remainder of the year under the new Federal program is promising, particularly as to highway and grade crossing projects.

Virginia Bridge & Iron Co. is expecting to be awarded 600 tons of structural steel by the TVA for a bridge over Elk River in northern Alabama. Hardie Tynes Mfg. Co. is also expecting contracts for gates and other equipment on six Ohio River dams.

Pressure pipe business is steady. May lettings were up to expectations, but June business will depend largely on the release of new Government funds. Shipments the last two or three months have been just about on a par with each other.

There is little activity in the scrap market, and demand in several lines is dormant.

## Northwest Lettings Are Feature on Coast

SAN FRANCISCO, May 27.—The Northwest held the spotlight on the Pacific Coast during the past week. On the Grand Coulee project, near Almira, Wash., two structural lettings of 220 and 120 tons went to Pacific Coast Steel Corpn. and Isaccson Iron Works respectively. Joseph T. Ryerson & Son, Inc., will construct a mixing plant, requiring 300 tons of shapes, near Odair, Wash. Approximately 163 tons of structural steel is included in a State bridge in Nampa County, Idaho, which was booked by American Bridge Co.

Among the new structural steel projects, more numerous than for several months, work in the Northwest is outstanding. It is reported that the Bureau of Reclamation will take bids late in June for the main gates at Bonneville dam. Approximately 5000 tons of structural steel is involved. Bids have been opened at Almira, Wash., on a construction trestle and cement silos, requiring 2600 tons and 700 tons. Plans are being prepared at Spokane, Wash., for a city dam. Preliminary estimates call for 250 tons of sheet piling, 440 tons of structural steel and plates and 500 tons of reinforcing bars.

Pacific Coast Steel Corpn. successfully bid on 3033 tons of reinforcing bars for the San Francisco-Oakland bridge distribution structure. Awards have not yet been reported on the 350 tons of joists, 100 tons of structural steel and 330 tons of pipe railing required on the project. In Los Angeles the Soule Steel Co. and Blue Diamond Corpn. took 247 tons and 200 tons of bars respectively on two jobs.

The Pacific Coast will undoubtedly receive a fair share of the appropriations recently made by Congress. However, the distribution of funds is not expected to be much of a stimulus for several months.

## Buffalo Operations Maintained

BUFFALO, May 28.—Buffalo steel operations are the same as last week, with Bethlehem's Lackawanna plant operating nine furnaces, Republic Steel Corpn., five furnaces, and Wickwire-Spencer Steel Corpn., one. Seneca sheet division of Bethlehem is at 75 per cent of capacity.

Considerable small fabricated structural business is being placed, but large jobs are scarce. The New York Central Railroad station in Syracuse will require 500 tons.

The scrap situation grows warmer with the purchase by the second largest consumer in the district of No. 2 heavy melting steel at $10. Old material is very scarce, with dealers unwilling to sell at present prices. It is understood that the seller of the No. 2 steel order is already offering $10 to cover. New bundles are said to be bringing $13.50, Weirton. Dealers are asking $12 for No. 1 machinery cast. In the main there are few sales, with dealers impounding every ton of material they can get to await a rising market. At the present rate of operations, dealers believe that it will be but a short time before mills will be forced to buy quantities of scrap, unless the open-hearth pace diminishes radically within the next few weeks. With 15 open-hearths in operation, scrap consumption is figured around 30,000 tons per month.

Pig iron sales are steady, with some increase in volume.

# Highway Steel and Tin Plate Relieve Lull at New York

## Construction Counted On to Offset Seasonal Decline During Summer Months—Short-Range Buying Is Rule

NEW YORK, May 28.—Except for an improvement in tin plate releases and the receipt of shipping orders against old highway projects which had been held up for lack of funds, the general trend of steel bookings is still downward. The trade is pinning its hopes on Federal-financed construction work to offset in part the loss of tonnage from other sources as business enters the customarily dull summer season. Bids on some of the new highway and grade separation projects authorized under the Federal works relief bill are expected to be taken during the latter half of June. Foreign steel, which is banned on PWA jobs, is not moving as well as formerly.

Construction of small apartment houses is on the increase in the metropolitan district. Sheet metal plants have been benefited, but a fairly large percentage of the structural steel used is second-hand material.

Railroads, although spending little for new equipment, are keeping their shops fairly busy. The Delaware & Hudson is installing air-conditioning equipment in some of its passenger cars. The 25 five-section articulated train units recently ordered for the Brooklyn-Manhattan Transit Corpn., New York, are to be built of high-tensile steel.

The Naval appropriation bill, though likely to be sharply contested, is expected to be passed eventually with its present authorization of 24 new vessels.

Uncertainty as to the future of the code is limiting new business to immediate needs. The suggestion that a trade body might be set up to prohibit unfair prices in place of the code authority is not taken seriously. Elimination of unfair competition has not been due so much to code enforcement as to removal of the fear of prosecution under the anti-trust laws.

### Pig Iron

As in previous weeks, foundries are limiting their purchases to small lots with immediate shipment specified in most cases. Total bookings of district sellers amounted to 1450 tons during the past week, as compared with 1400 tons a week earlier and 1150 tons sold a fortnight ago. Even though the volume of melt in this area is slightly heavier than in previous weeks, pig iron sellers look for no improvement in sales until foundries get some assurance of the continuance of the NRA and the present price schedules.

### Cast Iron Pipe

Most sellers are adhering closely to the published price schedule of $45 a ton, New York base, for carloads of 6-in. and larger. New inquiries are still very scarce, but foundries are looking forward to the release of sizable tonnages in the fall, when Federal funds are made available for projects in this area. Donaldson Iron Works, Emaus, Pa., will furnish 350 tons of 36-in. pipe for installation at Greenburgh, N. Y., and R. D. Wood & Co. is low bidder on 140 tons of 8-in. for Yonkers, N. Y.

### Reinforcing Steel

A fair demand for small lots of wire mesh and reinforcing bars continues, but projects calling for more than 100 tons are still very scarce. P. T. Cox Contracting Co. will soon let 900 tons of bars for a Staten Island, N. Y., grade crossing, and general contract tenders are due on June 14 for the Hendrik Hudson Bridge across the Harlem River, N. Y. This latter job will require about 1200 tons of bars.

### Scrap

Brokers continue buying No. 1 and No. 2 steels at $8.50 and $7 a ton respectively in truck lots loaded on barges. Also, No. 2 cast and stove plate are being purchased at $6.25 for shipment to the British Isles. The market is currently very firm on the strength of more urgent demands from foreign melters. The delay of shipments of No. 2 steel to Italy has resulted in an acute shortage of scrap there, which is particularly serious at this time inasmuch as that country may soon be engaged in an African war. It has been stated that Italian agents may soon be established in this country to purchase additional quantities of scrap on a 100 per cent cash basis.

# Scrap Market Up 50c. In Southern Ohio

CINCINNATI, May 28.—Renewed strength of scrap in other areas is reflected here in an upward movement of prices, dealers' bids having advanced 50c. on all items. In addition, mill interest in covering needs before the effective date of intrastate freight advances brought a slight flurry of orders for miscellaneous types of scrap. Malleable scrap is showing greater strength as the available supply diminishes, but blast furnace material is plentiful. While current orders are not large, the renewed buying interest tends to stimulate dealer speculation. Shipments on contract are slightly heavier.

Easing of automotive demand is depressing new pig iron business in this area. Total tonnage, the past week, was in the neighborhood of 600 tons. Reaffirmation of prices for third quarter has removed hope for heavy ordering to avoid price increases. Allowance of freight emergency advances on rates, effective June 1, on intrastate shipments has resulted in little reaction. Southern furnaces will continue to absorb a portion of the advance to maintain the differential of 38c. The new rate on Hamilton shipments will be $1.08, which will necessitate an absorption by Southern producers of about 14c. a ton. The melt is easing slightly, although an improvement in machine tool foundry operations may tend to offset the lull in other lines.

Extraordinary demand for galvanized sheets has tended to offset the recession in the requirements of household appliance makers, and mill bookings are holding at 70 per cent of capacity. Operations in the galvanized units of the leading district interest are at 100 per cent. Automotive demand also is steady despite reports of curtailed production in the Detroit area. Reaffirmation of present prices for third quarter indicates a low margin for district mills in view of higher costs under the advanced freight rates. This advance in cost is estimated at $1 a ton.

# Cleveland District Nonplused By Wiping Out of NRA

## Sellers Will Try to Maintain Filed Code Prices—Ingot Output Is Up Two Points to 45 Per Cent

CLEVELAND, May 28.—The steel industry is stunned by the wiping out of NRA by the Supreme Court decision, declaring it unconstitutional, and by the quick decision of the Government to abandon all codes by withdrawing their legal enforcement. With the elimination of its code, the steel industry is confronted with the problem of upholding its price structure without support of Federal law.

The general sentiment of the industry is to try to maintain present prices which have been filed for the third quarter for which books are to be opened June 1. These prices for the present will be quoted on all new business. Buying, it is expected, will be temporarily checked to some extent by the enforced abandonment of the steel code. However, before the Supreme Court decision, the extension of NRA after June 16 was uncertain and very little forward buying for the third quarter had been looked for.

The lack of interest in third quarter commitments is much different from the situation three months ago when many consumers of sheets were anxious to get orders entered on the day books were opened for the second quarter in order to secure early rolling.

Ingot output in the Cleveland-Lorain territory was stepped up two points this week by the starting up of an additional open-hearth furnace in Lorain.

New business is holding to recent volume and the tonnage entered in May will about equal that taken during April. Demand from the motor car industry remains fair, being well supported by orders from plants making Ford, Chevrolet and Chrysler parts. Construction activity is confined mostly to public work, although there is some improvement in private building construction requiring small lots of steel. New demand from railroads is negligible.

Scrap prices have advanced.

### Pig Iron

That the peak of the demand from the automotive industry has been passed for the season is indicated by tapering off of new business from that source. However, this has not yet affected shipments, which are holding up to recent volume. New business is very light, with few orders for more than car lots. Consumers are buying only for immediate needs. The Struthers Iron & Steel Co. this week is starting up its blast furnace at Struthers, Ohio, making foundry iron.

### Iron Ore

The movement of ore is lighter than at this time last year, following an unusually good record of shipments during April. There are 152 bulk freight boats in commission, representing 52.36 per cent of the Lake vessel capacity, as compared with 188 boats or 60.67 per cent of capacity last year. These figures show operations as of May 15, but there has been little change since that date. Of the total number of boats operating, 120 are carrying ore, as compared with 139 this time a year ago.

### Bolts and Nuts

Bolt and nut prices have been reaffirmed at 70, 10 and 5 per cent off list for third quarter. Stove bolts are unchanged. Weakness is still reported in some sections, mostly in sales to jobbers. Orders during May will show a 10 per cent falling off as compared with April. Demand from the automotive industry is declining. The trade looks for good business in the latter part of the year.

### Bars, Plates and Shapes

Orders for merchant bars from automobile parts and implement manufacturers and miscellaneous consumers are holding up fairly well, although shipments in some cases have been held up by labor trouble. New activity in the construction field is supplied largely by work in connection with the Muskingum district conservancy project. New inquiries are out for the Pleasant Hill and Atwood dams in that project, requiring 1025 tons of reinforcing bars and 110 tons of structural shapes. Cleveland will take bids, May 31, for an Administration building for the easterly sewage disposal plant, requiring 420 tons of bars and shapes.

### Sheets

Shipments continue good from the automotive industry and some new business is coming from that source to round out stocks for June production. Miscellaneous business is fair. Enameling sheets are still in good demand from washing machine tub and stove manufacturers. The local continuous hot mill is shut down, but cold mills are scheduled for 60 per cent operations this week. Newton Steel Co. resumed operations of its Monroe, Mich., plant Monday after a four-week shut-down caused by a strike.

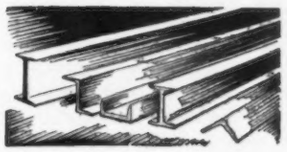
### Strip Steel

Activity is light in both hot and cold strip. While shipments have declined, they are heavier than new orders. Automobile parts plants built up stocks for Chevrolet cars during the recent strike. Some of these plants have outstanding orders, releases against which are expected in June for July production. The local cold strip mill is operating this week at 20 per cent of capacity.

### Scrap

Prices have turned upward on nearly all grades. Advances of 25c. a ton have been made on heavy melting steel, $1 or more a ton on machine shop turnings and some other steel-making grades and 50c. a ton on blast furnace scrap. Several thousand tons of blast furnace scrap were purchased by a Cleveland steel plant during the week at $7.50, or $1 a ton higher than this consumer paid a few weeks ago. That prices that have been prevailing were too low is given as the reason for the stiffening up of the local market in the face of declining steel production. Brokers are complaining that it is hard to buy scrap because many yard dealers are unwilling to sell at ruling quotations. Some purchases for yard stocks were made recently at the prices prevailing before the advance. Dealers are paying $11.50 to $11.75 for No. 1 heavy melting steel for shipment to Youngstown, against $12 orders placed ten days ago. There is some activity in compressed sheet steel for which dealers are paying $12 to $12.25, delivered Steubenville.

# Philadelphia Disorganized As Code Disintegrates



## No Indications of Price Changes Despite Pressure from Consumers—Export Scrap Market Very Active

PHILADELPHIA, May 28.—At least a 21-month extension of NRA was expected by the steel industry; consequently the decision of the Supreme Court and the subsequent dissolution of code provisions, effective today, has resulted in a mild upheaval in this area. Although larger steel consumers immediately exerted pressure for lower prices, particularly for sizable commitments, all mill representatives in this district are of the opinion that current price schedules will continue effective for some time, or at least until the mills are able to study the implications involved and formulate definite sales policies. With many still mills losing money, the trade is almost a unit regarding the advisability of retaining present prices. Nevertheless, the collapse of code regulations comes at an inopportune time, particularly in this district where operations have been down to a very low level for some time, and all mills are anxious for additional tonnage.

The largest district mill has advanced operations one point, but the Coatesville producer has taken off a furnace. Therefore, the district operating rate is practically unchanged from a week ago at 32 per cent of capacity. Although Alan Wood and Worth Steel are both operating two furnaces, there is a strong possibility that one furnace will be cut out at each plant unless general business improves over the next few weeks. The Pencoyd plant continues to melt in three furnaces and roll on one structural mill a single turn each day.

Steel shipments to the New York Shipbuilding Co. are still being held up due to a strike. Building activity at the Philadelphia Navy yard is increasing, however, and mills are shipping greater quantities of steel to that point.

### Pig Iron

The melting volume of nearby foundries and steel mills is practically unchanged from a month ago. Buying of pig iron, however, has fallen to a very low level as a result of the chaotic conditions following the disintegration of code provisions. Despite the assertions of furnace representatives that present code prices will be maintained for the time being, iron buyers are apparently committed to the policy of purchasing only their most urgent needs in order that full advantage may be taken of price changes, if any should occur in the near future.

### Imports

The following iron and steel imports were received here last week: 1450 tons of iron ore from Persia and 541 tons of pig iron from British India.

### Bars, Plates and Shapes

Practically all of the requirements of the Erie ferryboat have been placed, but sellers expect no action on the two tankers for the Gulf Refining Co. for several weeks yet. The Bureau of Supplies and Accounts, Washington, is asking for bids until June 18 on 990 tons of plates for delivery to various Navy yards, and local mills are now entering tenders on 440 tons of plates, angles and bars for a ferryboat for Norfolk County Ferry Co., Norfolk, Va. McClintic-Marshall Corpn. will furnish 100 tons of shapes for a Rupert, Pa., bridge for the Reading railroad, and the only new project calls for an estimated 200 tons of shapes for a Bucknell College building at Lewisburg, Pa. Merchant bars are very quiet.

### Sheets and Strip

Local autobody stamping plants are much less active than a month ago; consequently day-to-day ordering of full-finished sheets has tapered off considerably. Even more significant is the action of several large buyers in delaying releases for a week or more in order to exert pressure on mills to offer better price terms on fair-sized commitments. Despite this pressure, however, there has been no known instance of a break in the 3.26c., Philadelphia, price for light cold-rolled sheets or 2.06c., Pittsburgh, for fender stock. Consumer demand for strip and blue annealed sheets has fallen off considerably as a reflection of the confusion which currently exists as regards to the stability of prices for large-sized tonnages or far-forward delivery of current purchases.

### Scrap

Several steel mills are feeling out the market, but no buying has been forthcoming. Consequently this market, although strong, has had no excuse to rise in sympathy with Mid-Western markets. There is little likelihood that the operating rate here will rise over the next few weeks and, from present indications, there will be no great amount of new business maturing over the summer months. Thus, if the present strength in scrap persists, it will probably be a reflection of the active condition of the export market. Over 6700 tons of No. 1 and No. 2 steel will leave Port Richmond this week for Japan, and another boat will start loading next week. Exporters are accepting a few additional Japanese commitments, but very little new business for Italy has been consummated. This latter country is badly in need of scrap due to a delay of shipments from the United States, and it has been stated that Italian offices may soon be set up in this country to speed up shipments on a 100 per cent cash basis.

## Pipe Lines

**Fort Smith, Ark.,** closes bids June 17 for 67,800 ft. of 27-in. steel pipe, with alternate bids on cast iron and concrete, and 2500 ft. of steel pipe for Arkansas River bridge crossing (Section 2), 48,500 ft. of 27-in. welded steel pipe (Section 3), and 15,800 ft. of 16, 20 and 24-in. cast iron pipe for new water system. Fund of $1,650,000 has been arranged for this and other equipment for which bids will be received at same time. W. R. Holway, 302 East Eighteenth Street, Tulsa, Okla., is consulting engineer.

**General Purchasing Officer,** Panama Canal, Washington, asks bids until June 3 for 43,000 ft. of galvanized steel pipe, and 3000 ft. of black steel pipe (Schedule 3059).

**Button Natural Gas Co., Inc.,** P. N. Adams, Hector, N. Y., treasurer, plans steel pipe lines in connection with development of gas wells in Seneca County. Cost over $50,000.

**Vermillion Natural Gas Co.,** Vermillion, S. D., recently organized, care of E. A. Lenhart, city auditor, plans steel pipe lines for natural gas distribution.

**Tacoma, Wash.,** will soon take bids for 550 ft. of 58-in., 5698 ft. of 48-in., and 14,626 ft. of 42-in. steel pipe (with alternate bids on concrete for 58-in. and 13,490 ft. of 42-in.) for third unit of Green River gravity water supply line. Cost $467,000. W. A. Kunigk is water superintendent in charge.

**Treadwell Construction Co.** has been awarded 1075 tons for conduits for the Tygart Valley-Park View dam, Tygart, W. Va.

**Wisconsin Steam Corpn.,** Sidney P. Hall, 335 McKinley Avenue, Eau Claire, Wis., vice-president and general manager, plans steel pipe lines for central steam heating from new central steam power plant at Dewey Street and Eau Claire River. Entire project will cost about $200,000.

**Fort Peck, Mont.,** has placed 600 tons of land pipe with Taylor Forge & Pipe Co., Chicago.

## Reinforcing Steel

### Awards 5040 Tons—New Projects 11,045 Tons

**AWARDS**

**Chicago,** 880 tons, Armour & Co., to Joseph T. Ryerson & Son.

**Chicago,** 675 tons, Division G of Sanitary District, to an unnamed bidder.

**Los Angeles County, Cal.,** 247 tons, State bridge over Arroyo de las Posas, to Soule Steel Co.

**Los Angeles,** 200 tons, walnut storage warehouse, to Blue Diamond Corpn.

**San Francisco,** 3033 tons, Trans-Bay distribution structure, to Pacific Coast Steel Corpn.

**NEW REINFORCING BAR PROJECTS**

**North Eastport, Me.,** 6500 tons, tidewater hydro-electric power development.

**Staten Island, N. Y.,** 900 tons, grade crossings; P. T. Cox Contracting Co. low on general contract bid.

**New York,** 1200 tons, Hendrik Hudson bridge across Harlem River; tenders due June 14 to Hendrik Hudson Bridge Authority.

**Waukegan, Ill.,** 1000 tons, filter plant; Hanson Brothers, general contractors.

**Glenview, Ill.,** 180 tons, overhead crossing.

**State of Illinois,** 125 tons, road work; bids opened May 29.

**St. Louis,** 1500 tons, superstructure of post office; Great Lakes Construction Co., Chicago, low bidder on general contract.

**Bozeman, Mont.,** 100 tons, court house.

**Los Angeles,** 140 tons, Copper Basin siphon on Colorado River aqueduct; bids June 20.

**Loma Linda, Cal.,** 100 tons, two laboratory buildings.

**Santa Monica, Cal.,** 150 tons, Miles Avenue school; bids soon.

**Medford, Ore.,** 141 tons, city sewage disposal plant; bids June 12.

**Spokane, Wash.,** 500 tons, city dam; plans being completed.

## Boston Scrap Market Is Firmer

BOSTON, May 28.—Although few, if any, actual sales of No. 1 and No. 2 steel scrap for Pittsburgh district delivery have been made, offers for such material are higher, and offers for steel turnings and bundled skeleton also have been lifted at least 25c. to 35c. a ton or more. The lowest offer made for No. 1 steel delivered the past week was $12.25 a ton, and the highest, $12.75. Bundled skeleton offers are not less than $5 a ton, f.o.b., and steel turnings, $2.40. Actual sales of export No. 1 steel continue to be made at $8.50 a ton, delivered army base here, and No. 2 steel at $7.50. One steamer here is finishing loading 7200 tons, and one at Providence, R. I., 1600 tons, part of a 3500-ton cargo. Nashua, N. H., and Portland, Me., interests have purchased the Sandy River & Rangeley Lake Railroad. Engines and other rolling stock have been sold to Nicaragua, and rails, estimated at 10,000 tons, to Japan, shipments to be made from Portland, Me.

The weekly turnover in pig iron was again very small. There is nothing to indicate when business will improve.

Three or four good tonnages of cast iron pipe are still hanging fire, but there is little new business in prospect. The local pipe foundry is operating four days per week.

## Scrap Rises Again At St. Louis

ST. LOUIS, May 28.—A further increase in the prices of a number of scrap items was recorded this week, although the steel mills in the district are not buying. The advances are said to be due to light offerings and the inclination of dealers to hold on to their stocks. Nos. 1 and 2 heavy melting steel, miscellaneous standard-section rails and railroad springs are 25c. a ton higher, and cast iron carwheels are up 50c. The St. Louis-San Francisco Railway has issued a list of 50 carloads.

While the melt of pig iron in the St. Louis territory is said to be off as a whole, the agricultural implement industry is operating at the same high rate of production, and even higher than heretofore in some lines. There has been a slowing down in the melt of the stove and washing machine trades. It is estimated that shipments for May will be from 25 to 30 per cent less than in April. This is accounted for in part by the heavy shipments prior to the emergency freight rate advance.

While two of the seven structural steel fabricating plants in the district are operating at 75 per cent of capacity, the average is said to be about 25 per cent.

## Navy to Take Bids On Plate Tonnage

WASHINGTON, May 28.—The Bureau of Supplies and Accounts, Navy Department, will open bids June 18 for 990 tons of steel plates for delivery at various Navy Yards.

## Chicago First in 1934 Steel Output

MORE steel was produced last year in the Chicago wage district than in any other steel-producing section of the country, according to reports to the American Iron and Steel Institute. The Chicago wage district is defined in the steel code as the Chicago switching district, Lake and DuPage counties, Ill.; Lake County, Ind., and Kenosha, Racine and Milwaukee counties, Wis.

Steel plants in this district produced 4,699,533 gross tons of steel ingots during 1934, approximately 18½ per cent of the nation's total production last year. This tonnage was slightly less than one-third of the district's annual ingot capacity of 14,139,804 gross tons.

Pig iron production in the Chicago district during 1934 totaled 2,832,504 gross tons—slightly under 29 per cent of the capacity of 9,785,700 gross tons.

In the production of these tonnages of ingots and pig iron and of the great variety of other steel code products, employment was given to 53,203 residents of the Chicago wage district in the 41 plants located in that district.

Total payrolls of the 41 plants producing code steel products in the Chicago district during 1934 amounted to $59,762,641.

## Duties Slashed in Swedish Agreement

WASHINGTON, May 28.—The reciprocal trade agreement made between the United States and Sweden provides for reductions in the American duties on high-priced classes of iron and steel.

The rate on sponge iron is reduced from $2.25 to $1.20 per ton.

Muck bar valued at above 2½c. a lb. takes a reduction from existing rates of 0.8c., 1c. and 1½c. per lb. to ½c., 0.8c. and 1c. per lb.

On unfinished steel bars, sheets and slabs valued at 2½c. to 8c. per lb. the rate was reduced from 1 1/7c. per lb. to 20 per cent ad valorem, while on round wire valued at over 6c. per lb. the duty was slashed from 25 to 20 per cent ad valorem.

On flat wire and steel strips the present duty of 25 per cent ad valorem was cut to 15 and 20 per cent ad valorem.

On alloy steels valued over 3½c. per lb. and not over 8c. per lb. the duty also was cut from the present duty of 8 per cent additional duty on value plus the specific rates to 4 per cent additional duties plus existing specific rates.

# Lead Quotations Advance to Highest Levels Since October, 1933

Zinc Also Up Five Points—Tin Fluctuates Around 52c. Level—Copper Price Uncertain Because of Collapse of NRA

NEW YORK, May 28.—The Supreme Court decision invalidating NRA codes threw the copper market into confusion yesterday and developments were lacking this morning as the industry's code authority met in executive session. Some sort of an announcement clarifying the situation was expected before tomorrow. The court decision came at a time when an advance in the Blue Eagle price of 9c. a lb., Connecticut Valley, was being talked about. The electrolytic price at London reached 8.50c. a lb. Saturday and held around that level yesterday. However, a reaction occurred this morning bringing the quotation down to 8.37½c., usual Continental base ports. Sales here last week were not particularly heavy and for the month through Saturday had totaled only 22,000 tons. No figures on yesterday's business were available and further information on the subject awaits clarification of the code situation.

## Tin

The tin market remains unusually dull, although prices have worked up to slightly higher levels. Straits metal was quoted in New York Friday at 52.25c. a lb., but had eased off to 51.75c. this morning. Fluctuation in sterling exchange accounted for a large part of the movement. Transactions here are so light that it is difficult to determine the character of demand. It is certain, however, that consumers are showing no interest in the future and seem to have sufficient supplies of tin on hand or bought to warrant little little attention being paid to spot purchases. Tin plate operations are well sustained. At London this morning standard tin was quoted at £230 5s. for spot and £223 for futures. Straits metal was offered at £240 5s. and the price at Singapore was £233 5s.

## Lead

The advance in lead prices was resumed yesterday when quotations were advanced $2 a ton to 4.20c., St. Louis, and 4.35c. a lb., New York. The St. Joseph Lead Co., which inaugurated the increase, continues to ask a $1 a ton premium on sales in the East. The last change followed advances of $3 a ton on Monday and Wednesday of last week and brought the total increase achieved during the movement to $17 a ton. Lead quotations are now at the highest level since October, 1933. Demand still seems to be unabated and speculative purchases are not believed to be a very important factor. June metal is by no means entirely sold and leading sellers have not yet opened their books for July. Continuance of the strike in the ore fields is unquestionably a bullish factor in the market and the persistent strength of European prices is helpful. The April reduction in stocks amounted to about 8500 tons and a further decrease is expected this month.

## Zinc

Zinc prices were advanced five points late on Thursday and the market Friday was generally quotable at 4.30c. a lb., East St. Louis, and 4.67½c., New York. Sales continue at a fairly high level, having totaled about 7500 tons last week, compared with 9000 tons in the previous period. June metal is fairly well sold, but market transactions this week will likely show no marked decrease. Ore production is still negligible and shipments last week amounted to only about 50 tons.

## Ingot Brass and Bronze

The Non-Ferrous Ingot Metal Institute reports that in the 28-day period ended May 17, the average prices paid for commercial 80-10-10 and commercial 85-5-5-5 brass ingots were 9.344c. a lb. and 7.796c. a lb. respectively.

### The Week's Prices. Cents Per Pound for Early Delivery

| | May 22 | May 23 | May 24 | May 25 | May 27 | May 28 |
|---|---|---|---|---|---|---|
| Electrolytic copper, N. Y.* | 8.75 | 8.75 | 8.75 | 8.75 | 8.75 | 8.75 |
| Lake copper, N. Y. | 9.12½ | 9.12½ | 9.12½ | 9.12½ | 9.12½ | 9.12½ |
| Straits tin, spot, New York | 51.60 | 52.00 | 52.25 | .... | 51.75 | 51.75 |
| Zinc, East St. Louis | 4.25 | 4.25 | 4.30 | 4.30 | 4.30 | 4.30 |
| Zinc, New York† | 4.62½ | 4.62½ | 4.67½ | 4.67½ | 4.67½ | 4.67½ |
| Lead, St. Louis | 4.10 | 4.10 | 4.10 | 4.10 | 4.20 | 4.20 |
| Lead, New York | 4.25 | 4.25 | 4.25 | 4.25 | 4.35 | 4.35 |

*Refinery quotations: price ¼c. higher delivered in Connecticut.
†Includes emergency freight charge.

Aluminum, virgin 99 per cent plus, 19c. to 22c. a lb., delivered.
Aluminum, remelt No. 12 (alloy), carload lots delivered, 14c. a lb., average for week.
Nickel, electrolytic, 35c. to 36c. a lb. based at refinery in lots of 2 tons or more.
Antimony, 12.75c. a lb., New York.
Brass ingots, 85-5-5-5, 8.25c. a lb., New York and Philadelphia.

### From New York Warehouse

*Delivered Prices, Base per Lb.*

| | |
|---|---|
| Tin, Straits pig | 52.75c. to 53.75c. |
| Tin, bar | 54.75c. to 55.75c. |
| Copper, Lake | 10.25c. to 11.00c. |
| Copper, electrolytic | 10.00c. to 10.50c. |
| Copper, castings | 9.75c. to 10.75c. |
| *Copper sheets, hot-rolled | 16.00c. |
| *High brass sheets | 14.25c. |
| *Seamless brass tubes | 16.00c. |
| *Seamless copper tubes | 16.25c. |
| *Brass rods | 12.75c. |
| Zinc, slabs | 5.75c. to 6.75c. |
| Zinc, sheets (No. 9), casks, 1200 lb. and over | 10.25c. |
| Lead, American pig | 4.62½c. to 5.62½c. |
| Lead, bar | 5.62½c. to 6.62½c. |
| Lead, sheets | 7.75c. |
| Antimony, Asiatic | 15.50c. to 16.50c. |
| Alum., virgin, 99 per cent, plus | 23.30c. |
| Alum., No. 1 for remelting, 98 to 99 per cent | 18.00c. to 19.00c. |
| Solder, ½ and ½ | 30.00c. to 31.00c. |
| Babbitt metal, commercial grades | 25.00c. to 60.00c. |

*These prices are also for delivery from Chicago and Cleveland warehouses.

### From Cleveland Warehouse

*Delivered Prices per Lb.*

| | |
|---|---|
| Tin, Straits pig | 55.75c. |
| Tin, bar | 57.75c. |
| Copper, Lake | 10.00c. |
| Copper, electrolytic | 10.00c. |
| Copper, castings | 9.75c. |
| Zinc, slabs | 5.75c. to 6.00c. |
| Lead, American pig | 5.00c. to 5.75c. |
| Lead, bar | 8.25c. |
| Antimony, Asiatic | 15.75c. |
| Babbitt metal, medium grade | 19.25c. |
| Babbitt metal, high grade | 59.75c. |
| Solder, ½ and ½ | 33.00c. |

### Old Metals, Per Lb., New York

*Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)*

| | Dealers' Buying Prices | Dealers' Selling Prices |
|---|---|---|
| Copper, hvy. crucible | 6.12½c. | 6.87½c. |
| Copper, hvy. and wire | 6.00c. | 6.50c. |
| Copper, light and bottoms | 5.00c. | 5.50c. |
| Brass, heavy | 3.37½c. | 4.00c. |
| Brass, light | 2.62½c. | 3.37½c. |
| Hvy. machine composition | 4.87½c. | 5.37½c. |
| No. 1 yel. brass turnings | 4.37½c. | 4.87½c. |
| No. 1 red brass or compos. turnings | 4.62½c. | 5.12½c. |
| Lead, heavy | 2.87½c. | 3.25c. |
| Zinc | 2.25c. | 2.62½c. |
| Cast aluminum | 10.62½c. | 11.75c. |
| Sheet aluminum | 12.00c. | 13.50c. |

# Prices of Finished Steel and Iron Products

## BARS, PLATES, SHAPES

### Iron and Steel Bars

| *Soft Steel* | *Base per Lb.* |
|---|---|
| F.o.b. Pittsburgh | 1.80c. |
| F.o.b. Chicago | 1.85c. |
| F.o.b. Gary | 1.85c. |
| F.o.b. Duluth | 1.95c. |
| Del'd Detroit | 1.95c. |
| F.o.b. Cleveland | 1.85c. |
| F.o.b. Buffalo | 1.90c. |
| Del'd Philadelphia | 2.11c. |
| Del'd New York | 2.15c. |
| F.o.b. Birmingham | 1.95c. |
| F.o.b. cars dock Gulf ports | 2.20c. |
| F.o.b. cars dock Pacific ports | 2.35c. |

*Rail Steel*

(For merchant trade)

| | |
|---|---|
| F.o.b. Pittsburgh | 1.70c. |
| F.o.b. Chicago | 1.75c. |
| F.o.b. Gary | 1.75c. |
| F.o.b. Moline, Ill. | 1.75c. |
| F.o.b. Cleveland | 1.75c. |
| F.o.b. Buffalo | 1.80c. |
| F.o.b. Birmingham | 1.85c. |
| F.o.b. cars dock Gulf ports | 2.10c. |
| F.o.b. cars dock Pacific ports | 2.25c. |

*Billet Steel Reinforcing*

(Straight lengths as quoted by distributers)

| | |
|---|---|
| F.o.b. Pittsburgh | 2.05c. |
| F.o.b. Chicago | 2.10c. |
| F.o.b. Gary | 2.10c. |
| Del'd Detroit | 2.20c. |
| F.o.b. Cleveland | 2.10c. |
| F.o.b. Youngstown | 2.10c. |
| F.o.b. Buffalo | 2.10c. |
| F.o.b. Birmingham | 2.10c. |
| F.o.b. cars dock Gulf ports | 2.45c. |
| F.o.b. cars dock Pacific ports | 2.45c. |

*Rail Steel Reinforcing*

(Straight lengths as quoted by distributers)

| | |
|---|---|
| F.o.b. Pittsburgh | 1.90c. |
| F.o.b. Chicago | 1.95c. |
| F.o.b. Gary | 1.95c. |
| F.o.b. Cleveland | 1.95c. |
| F.o.b. Youngstown | 1.95c. |
| F.o.b. Buffalo | 1.95c. |
| F.o.b. Birmingham | 1.95c. |
| F.o.b. cars dock Gulf ports | 2.30c. |
| F.o.b. cars dock Pacific ports | 2.30c. |

*Iron*

| | |
|---|---|
| F.o.b. Chicago | 1.80c. |
| F.o.b. Terre Haute, Ind. | 1.75c. |
| F.o.b. Louisville, Ky. | 2.10c. |
| F.o.b. Danville, Pa. | 1.80c. |
| F.o.b. Berwick, Pa. | 1.70c. |

### Cold Finished Bars and Shafting*

| | *Base per Lb.* |
|---|---|
| F.o.b. Pittsburgh | 1.95c. |
| F.o.b. Chicago | 2.00c. |
| F.o.b. Gary | 2.00c. |
| F.o.b. Cleveland | 2.00c. |
| F.o.b. Buffalo | 2.05c. |
| Del'd Detroit | 2.15c. |
| Del'd eastern Michigan | 2.20c. |

* In quantities of 10,000 to 19,000 lb.

### Fence and Sign Posts

| *Angle Line Posts* | *Base per Net Ton* |
|---|---|
| F.o.b. Pittsburgh | $50.00 |
| F.o.b. Chicago | 50.00 |
| F.o.b. Duluth | 51.00 |
| F.o.b. Cleveland | 50.00 |
| F.o.b. Birmingham | 53.00 |
| F.o.b. Houston, Orange, Beaumont, Galveston | 59.00 |
| F.o.b. Mobile | 58.00 |
| F.o.b. New Orleans, Lake Charles, Corpus Christi | 59.00 |
| F.o.b. cars dock Pacific ports | 63.00 |

### Plates

| | *Base per Lb.* |
|---|---|
| F.o.b. Pittsburgh | 1.80c. |
| F.o.b. Chicago | 1.85c. |
| F.o.b. Gary | 1.85c. |
| Del'd Cleveland | 1.995c. |
| F.o.b. Coatesville | 1.90c. |
| F.o.b. Sparrows Point | 1.90c. |
| Del'd Philadelphia | 1.99c. |
| Del'd New York | 2.09c. |
| F.o.b. Birmingham | 1.95c. |
| F.o.b. cars dock Gulf ports | 2.20c. |
| F.o.b. cars dock Pacific ports | 2.35c. |
| Wrought iron plates, f.o.b. P'gh | 3.20c. |

### Floor Plates

| | |
|---|---|
| F.o.b. Pittsburgh | 3.35c. |
| F.o.b. Chicago | 3.40c. |
| F.o.b. Coatesville | 3.45c. |
| F.o.b. cars dock Gulf ports | 3.75c. |
| F.o.b. cars dock Pacific ports | 3.90c. |

### Structural Shapes

| | *Base per Lb.* |
|---|---|
| F.o.b. Pittsburgh | 1.80c. |
| F.o.b. Chicago | 1.85c. |
| Del'd Cleveland | 1.995c. |
| F.o.b. Buffalo | 1.90c. |
| F.o.b. Bethlehem | 1.90c. |
| Del'd Philadelphia | 2.015c. |
| Del'd New York | 2.0625c. |
| F.o.b. Birmingham (standard) | 1.95c. |
| F.o.b. cars dock Gulf ports | 2.20c. |
| F.o.b. cars dock Pacific ports | 2.35c. |

### Steel Sheet Piling

| | *Base per Lb.* |
|---|---|
| F.o.b. Pittsburgh | 2.15c. |
| F.o.b. Chicago | 2.25c. |
| F.o.b. Buffalo | 2.25c. |
| F.o.b. cars dock Gulf ports | 2.60c. |
| F.o.b. cars dock Pacific ports | 2.60c. |

## SHEETS, STRIP, TIN PLATE TERNE PLATE

### Sheets

*Hot Rolled*

| | *Base per Lb* |
|---|---|
| No. 10, f.o.b. Pittsburgh | 1.85c. |
| No. 10, f.o.b. Gary | 1.95c. |
| No. 10, del'd Detroit | 2.05c. |
| No. 10, del'd Phila. | 2.16c. |
| No. 10, f.o.b. Birmingham | 2.00c. |
| No. 10, f.o.b. dock cars Pacific ports | 2.40c. |

*Hot-Rolled Annealed*

| | |
|---|---|
| No. 24, f.o.b. Pittsburgh | 2.40c. |
| No. 24, f.o.b. Gary | 2.50c. |
| No. 24, del'd Detroit | 2.60c. |
| No. 24, del'd Phila. | 2.71c. |
| No. 24, f.o.b. Birmingham | 2.55c. |
| No. 24, f.o.b. dock cars Pacific ports | 3.05c. |
| No. 24, wrought iron, Pittsburgh | 4.30c. |

*Heavy Cold-Rolled*

| | |
|---|---|
| No. 10 gage, f.o.b. Pittsburgh | 2.50c. |
| No. 10 gage, f.o.b. Gary | 2.60c. |
| No. 10 gage, del'd Detroit | 2.70c. |
| No. 10 gage, del'd Phila. | 2.81c. |
| No. 10 gage, f.o.b. Birmingham | 2.65c. |
| No. 10 gage, f.o.b. dock cars Pacific ports | 3.10c. |

*Light Cold-Rolled*

| | |
|---|---|
| No. 20 gage, f.o.b. Pittsburgh | 2.95c. |
| No. 20 gage, f.o.b. Gary | 3.05c. |
| No. 20 gage, del'd Detroit | 3.15c. |
| No. 20 gage, del'd Phila. | 3.26c. |
| No. 20 gage, f.o.b. Birmingham | 3.10c. |
| No. 24, f.o.b. dock cars Pacific ports | 3.50c. |

*Galvanized Sheets*

| | |
|---|---|
| No. 24 gage, f.o.b. Pittsburgh | 3.10c. |
| No. 24, f.o.b. Gary | 3.20c. |
| No. 24, del'd Phila. | 3.41c. |
| No. 24, f.o.b. Birmingham | 3.25c. |
| No. 24, f.o.b. dock cars Pacific ports | 3.70c. |
| No. 24, wrought iron, Pittsburgh | 4.95c. |

*Long Ternes*

| | |
|---|---|
| No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh | 3.40c. |
| F.o.b. Gary | 3.50c. |
| F.o.b. cars dock Pacific ports | 4.10c. |

*Vitreous Enameling Stock*

| | |
|---|---|
| No. 20, f.o.b. Pittsburgh | 3.10c. |

*Tin Mill Black Plate*

| | |
|---|---|
| No. 28, f.o.b. Pittsburgh | 2.75c. |
| No. 28, Gary | 2.85c. |
| No. 28, cars dock Pacific Coast ports | 3.35c. |

### Tin Plate

| | *Per Base Box* |
|---|---|
| Standard cokes, f.o.b. P'gh district mill | $5.25 |
| Standard cokes, f.o.b. Gary | 5.35 |
| Standard cokes, f.o.b. cars dock Pacific ports | 5.90 |

### Terne Plate

*(F.o.b. Pittsburgh)*

(Per Package, 20 x 28 in.)

| | |
|---|---|
| 8-lb. coating I.C. | $10.00 |
| 15-lb. coating I.C. | 12.00 |
| 20-lb. coating I.C. | 13.00 |
| 25-lb. coating I.C. | 14.00 |
| 30-lb. coating I.C. | 15.25 |
| 40-lb. coating I.C. | 17.50 |

### Hot-Rolled Hoops, Bands, Strips and Flats under ¼ In.

| | *Base per Lb.* |
|---|---|
| All widths up to 24 in., P'gh | 1.85c. |
| All widths up to 24 in., Chicago | 1.95c. |
| All widths up to 24 in., del'd Detroit | 2.05c. |
| All widths up to 24 in., Birmingham | 2.00c. |
| Cooperage stock, Pittsburgh | 2.10c. |
| Cooperage stock, Chicago | 2.20c. |

### Cold-Rolled Strips

| | *Base per Lb.* |
|---|---|
| F.o.b. Pittsburgh | 2.60c. |
| F.o.b. Cleveland | 2.60c. |
| Del'd Chicago | 2.895c. |
| F.o.b. Worcester | 2.80c. |

*Fender Stock*

| | |
|---|---|
| No. 14, Pittsburgh or Cleveland | 2.90c. |
| No. 14, Worcester | 3.30c. |
| No. 20, Pittsburgh or Cleveland | 3.30c. |
| No. 20, Worcester | 3.70c. |

### Hot-Rolled Rail Steel Strips

| | *Base per Lb.* |
|---|---|
| F.o.b. Pittsburgh | 1.70c. |
| F.o.b. Chicago | 1.75c. |
| F.o.b. Birmingham | 1.85c. |

## WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

| *To Manufacturing Trade* | *Per Lb.* |
|---|---|
| Bright wire | 2.30c. |
| Spring wire | 2.90c. |

*Chicago prices on products sold to the manufacturing trade are $1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are $2 a ton above, Birmingham $3 above, and Pacific Coast prices $9 a ton above Pittsburgh or Cleveland.*

*To Jobbing Trade*

Qualified jobbers are entitled to a reduction of 20c. a 100 lb. from the base price on carload shipments to stock, and of 10c. a 100 lb. on less-carload shipments to stock.

| | *Base per Keg* |
|---|---|
| Standard wire nails | $2.60 |
| Smooth coated nails | 2.60 |
| Galvanized nails: | |
| 15 gage and coarser | 4.60 |
| 16 gage and finer | 5.10 |

| | *Base per 100 Lb.* |
|---|---|
| Annealed fence wire | $2.45 |
| Galvanized fence wire | 2.80 |
| Polished staples | 3.30 |
| Galvanized staples | 3.55 |
| Barbed wire, galvanized | 3.00 |
| Woven wire fence, base column | 63.00 |

*Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh); Duluth, Minn., and Worcester, Mass., mill prices are $2 a ton over Pittsburgh (except for woven wire fence at Duluth which is $3 over Pittsburgh), and Birmingham mill prices are $3 a ton over Pittsburgh.*

*On wire nails, barbed wire, staples and fence wire, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are $6 a ton over Pittsburgh, while Pacific Coast prices are $8 over Pittsburgh. Exception: on fence wire Pacific Coast prices are $11 a ton above Pittsburgh.*

*On staples and barbed wire, prices of $6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.*

### Wire Hoops, Twisted or Welded

| | *Off List* |
|---|---|
| F.o.b. Pittsburgh | 35 and 2½ off |
| F.o.b. Chicago | 35 off |

## STEEL AND WROUGHT PIPE AND TUBING

### Welded Pipe

**Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio Mills**

F.o.b. Pittsburgh only on wrought iron pipe

*Butt Weld*

| *Steel* Inches | Black | Galv. | *Wrought Iron* Inches | Black | Galv. |
|---|---|---|---|---|---|
| ⅛ | 51½ | 29½ | ⅛ | +91½ | +138 |
| ¼ to ⅜ | 53½ | 35 | ¼ & ⅜ | +1½ | +21½ |
| ½ | 58½ | 47 | ½ | 31½ | 15 |
| ¾ | 62 | 52 | ¾ | 36½ | 20½ |
| 1 to 3 | 64 | 55 | 1 & 1¼ | 39½ | 25½ |
| | | | 1½ | 43½ | 28 |
| | | | 2 | 41½ | 26 |

*Lap Weld*

| | | | | | |
|---|---|---|---|---|---|
| 2 | 60 | 51 | 2 | 37 | 22½ |
| 2½ to 3 | 63 | 54 | 2½ to 3½ | 38 | 25 |
| 3½ to 6 | 65 | 56 | 4 to 8 | 40 | 28½ |
| 7 and 8 | 64 | 54 | 9 to 12 | 38 | 24½ |
| 9 and 10 | 63½ | 53½ | | | |
| 11 and 12 | 62½ | 52½ | | | |

*Butt Weld, extra strong, plain ends*

| | | | | | |
|---|---|---|---|---|---|
| ⅛ | 48½ | 33½ | ⅛ | +13 | +45½ |
| ¼ to ⅜ | 51 | 38 | ¼ & ⅜ | +2½ | +34½ |
| ½ | 56½ | 47½ | ½ | 32½ | 17½ |
| ¾ | 61 | 52 | ¾ | 37½ | 22½ |
| 1 to 3 | 63 | 55 | 1 to 2 | 43½ | 29 |

*Lap Weld, extra strong, plain ends*

| | | | | | |
|---|---|---|---|---|---|
| 2 | 58 | 50 | 2 | 40 | 26 |
| 2½ to 3 | 62 | 54 | 2½ to 4 | 45½ | 33 |
| 3½ to 6 | 65½ | 57½ | 4½ to 6 | 45 | 33½ |
| 7 and 8 | 64½ | 54½ | 7 & 8 | 46 | 33 |
| 9 and 10 | 63½ | 53½ | 9 to 12 | 41½ | 30 |
| 11 and 12 | 62½ | 52½ | | | |

On standard steel pipe an extra 5% of is allowed on sales to consumers while two 5's off apply on sales to jobbers. On less-than-carload shipments prices are determined by adding 20 and 25% and the carload freight rate to the base card. On structural steel pipe the base card is reduced 2 points and two 5's off are allowed to consumers and three 5's off to jobbers.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

### Boiler Tubes

*Seamless Steel Commercial Boiler Tubes and Locomotive Tubes*

(Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots)

| | | Cold Drawn | Hot Rolled |
|---|---|---|---|
| 1 in. o.d. | 13 B.W.G. | $ 8.60 | $7.32 |
| 1¼ in. o.d. | 13 B.W.G. | 10.19 | 9.29 |
| 1½ in. o.d. | 13 B.W.G. | 11.26 | 10.22 |
| 1¾ in. o.d. | 13 B.W.G. | 12.81 | 11.64 |
| 2 in. o.d. | 13 B.W.G. | 14.35 | 13.04 |
| 2¼ in. o.d. | 13 B.W.G. | 16.00 | 14.54 |
| 2½ in. o.d. | 12 B.W.G. | 19.29 | 17.54 |
| 2¾ in. o.d. | 12 B.W.G. | 26.45 | 18.39 |
| 3 in. o.d. | 12 B.W.G. | 21.45 | 19.50 |
| 4½ in. o.d. | 10 B.W.G. | 41.08 | 37.35 |
| 3½ in. o.d. | 11 B.W.G. | 27.09 | 24.62 |
| 4 in. o.d. | 10 B.W.G. | 33.60 | 30.54 |
| 4½ in. o.d. | 10 B.W.G. | 41.08 | 37.35 |
| 5 in. o.d. | 9 B.W.G. | 51.56 | 46.87 |
| 6 in. o.d. | 7 B.W.G. | 79.15 | 71.96 |

Extras for less-carload quantities:
25,000 lb. or ft. to 39,999 lb. or ft. 5 %
10,000 lb. or ft. to 24,999 lb. or ft. 12½ %
2,000 lb. or ft. to 9,999 lb. or ft. 25 %
Under 2,000 lb. or ft. 40 %

*Lapweld Steel and Knobbled Charcoal Iron Pressure Tubes*

(Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots)

| | | *Steel* | *Iron* |
|---|---|---|---|
| 1½ in. o.d. | 13 B.W.G. | $ 9.72 | $20.10 |
| 1¾ in. o.d. | 13 B.K.G. | 11.06 | 21.84 |
| 2 in. o.d. | 13 B.W.G. | 12.38 | 17.22 |
| 2¼ in. o.d. | 13 B.W.G. | 13.79 | 19.59 |
| 2½ in. o.d. | 12 B.W.G. | 16.58 | 24.19 |
| 2¾ in. o.d. | 12 B.W.G. | 17.54 | 26.46 |
| 3 in. o.d. | 12 B.W.G. | 18.35 | 28.39 |
| 3¼ in. o.d. | 11 B.W.G. | 21.56 | 33.95 |
| 3½ in. o.d. | 11 B.W.G. | 23.15 | 36.18 |
| 4 in. o.d. | 10 B.W.G. | 28.66 | 45.36 |
| 4½ in. o.d. | 10 B.W.G. | 35.22 | 56.49 |
| 5 in. o.d. | 9 B.W.G. | 44.25 | 61.86 |
| 6 in. o.d. | 7 B.W.G. | 68.14 | 102.44 |

Quantity Extras:

| | |
|---|---|
| 40,000 lb or ft. | base |
| 25,000 lb. or ft. to 39,999 lb. or ft. | plus 5% |
| 10,000 lb. or ft. to 24,999 lb. or ft. | plus 12½% |
| 2,000 lb. or ft. to 9,999 lb. or ft. | plus 25% |
| Under 2,000 lb. or ft. | plus 40% |

## CAST IRON WATER PIPE

| | *Per Net Ton* |
|---|---|
| *6-in. and larger, del'd Chicago | $48.40 |
| *4-in., del'd Chicago | 51.40 |
| 6-in. and larger, del'd New York | 45.00 |
| 4-in. del'd New York | 48.00 |
| *6-in. and larger, Birmingham | 40.00 |
| *4-in. Birmingham | 43.00 |

Class "A" and gas pipe, $3 extra.
*Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is £39, Birmingham, and $47.40, delivered Chicago, and 4-in. pipe, $42, Birmingham, and $50.40 a ton, delivered Chicago.

## RAILROAD MATERIALS

### Rails and Track Supplies

**F.o.b. Mill**

| | |
|---|---|
| Standard rails, heavier than 60 lb., per gross ton | $36.37½ |
| Angle bars, per 100 lb. | 2.35 |

**F.o.b. Code Basing Points**

| | |
|---|---|
| Light rails (from billets) per gross ton | $35.00 |
| Light rails (from rail steel) per gross ton | 34.00 |

| | *Base per 100 Lbs.* |
|---|---|
| Spikes, 9/16 in. and larger | $2.40 |
| Spikes, ½ in .and smaller | 2.60 |
| Tie plates, steel | 1.90 |
| Tie plates, Pacific Coast ports | 2.60 |
| Track bolts, to steam railroads | 3.55 |
| Track bolts, no jobbers, all sizes (per 100 count) | 70 per cent off list |

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Buffalo, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa.; on spikes alone, Cleveland, Youngstown, Lebanon, Pa., Columbia, Pa., Richmond, Va.

## BOLTS, NUTS, RIVETS AND SET SCREWS

### Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

*Per Cent Off List*

Machine bolts .....70, 10 and 5
Carriage bolts .....70, 10 and 5
Lag bolts .....70, 10 and 5
Plow bolts, Nos. 1, 2, 3 and 7 heads .....70, 10 and 5
Hot-pressed nuts, blank or tapped, square .....70, 10 and 5
Hot-pressed nuts, blank or tapped, hexagons .....70, 10 and 5
C.p.c. and t. square or hex. nuts, blank or tapped .....70, 10 and 5
Semi-finished hexagon nuts, U.S.S., all sizes .....70, 10 and 5
Semi-finished hexagon nuts, S.A.E. ¼ in. to 7/16 in. diameter..70, 10 and 5 ½ in. to 1 in. diameter....70, 10 and 5 larger than 1 in. diameter.....70
Stove bolts in packages, Pittsburgh ... 75
Stove bolts in packages, Chicago ..... 75
Stove bolts in packages, Cleveland .... 75
Stove bolts in bulk, Pittsburgh ..... 83
Stove bolts in bulk, Chicago ..... 83
Stove bolts in bulk, Cleveland ..... 83
Tire bolts .....60 and 5

### Large Rivets

(½-in. and larger)

*Base per 100 Lb.*

F.o.b. Pittsburgh or Cleveland.....$2.90
F.o.b. Chicago ..... 3.00
F.o.b. Birmingham ..... 3.05

### Small Rivets

(7/16-in. and smaller)

*Per Cent Off List*

F.o.b. Pittsburgh .....70 and 5
F.o.b. Cleveland .....70 and 5
F.o.b. Chicago and Birm'g'm.....70 and 5

### Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

*Per Cent Off List*

Milled cap screws, 1 in. dia. and smaller .....85 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller .....75 and 10
Milled headless set screws, cut thread ¾ in. and smaller .....75
Upset hex. head cap screws, U.S.S.S. or S.A.E. thread, 1 in. dia. and smaller .....87½
Unset set screw, cut and oval point.....80
Milled studs .....65 to 65 and 10

## Alloy and Stainless Steel

### Alloy Steel Ingots

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Uncropped .....$40 per gross ton

### Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, $49 a gross ton.

### Alloy Steel Bars

Price del'd Detroit is $52.

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.
Open-hearth grade, base .....2.45c.
Delivered price at Detroit is .....2.60c.

| S.A.E. Series Numbers | Alloy Differential per 100 lb. |
|---|---|
| 2000 (½ Nickel) | $0.25 |
| 2100 (1½% Nickel) | 0.55 |
| 2300 (3½% Nickel) | 1.50 |
| 2500 (5% Nickel) | 2.25 |
| 3100 Nickel Chromium | 0.55 |
| 3200 Nickel Chromium | 1.35 |
| 3300 Nickel Chromium | 3.80 |
| 3400 Nickel Chromium | 3.20 |
| 4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum) | 0.50 |
| 4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum) | 0.70 |
| 4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum) (1.50 to 2.00 Nickel) | 1.05 |
| 5100 Chromium Steel (0.60 to 0.90 Chromium) | 0.35 |
| 5100 Chromium Steel (0.80 to 1.10 Chromium) | 0.45 |
| 5100 Chromium Spring Steel | base |
| 6100 Chromium Vanadium Bar | 1.20 |
| 6100 Chromium Vanadium Spring Steel | 0.70 |
| Chromium Nickel Vanadium | 1.50 |
| Carbon Vanadium | 0.95 |

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars is ½c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

### Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 2.95c. base per lb.

### STAINLESS STEEL No. 302

(17 to 19% Cr. 7 to 9% Ni. 0.08 to 0.20% C.)

(Base Prices f.o.b. Pittsburgh)

*Per Lb.*

Forging billets .....19.55c.
Rerolling slabs ..... 15c.
Bars ..... 23c.
Plates ..... 26c.
Structural shapes ..... 23c.
Sheets ..... 33c.
Hot-rolled strip .....20¾c.
Cold-rolled strip ..... 27c.
Drawn wire ..... 23c.

# Raw and Semi-Finished Steel

### Carbon Steel Rerolling Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.
Uncropped .....$29 per gross ton

### Carbon Steel Forging Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Birmingham.
Uncropped .....$31 per gross ton

### Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.

*Per Gross Ton*

Rerolling .....$27.00
Forging quality ..... 32.00

Delivered Detroit

Rerolling .....$30.00
Forging ..... 35.00

Billets Only F.o.b. Duluth

Rerolling .....$29.00
Forging ..... 34.00

### Sheet Bars

Fo.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

*Per Gross Ton*

Open-hearth or Bessemer .....$28.00

### Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

*Per Lb.*

Grooved ..... 1.70c.
Universal ..... 1.70c.
Sheared ..... 1.70c.

### Tube Rounds

*Base per Lb.*

F.o.b. Pittsburgh ..... 1.80c.
F.o.b. Chicago ..... 1.85c.
F.o.b. Cleveland ..... 1.85c.
F.o.b. Buffalo ..... 1.90c.
F.o.b. Birmingham ..... 1.95c.

### Wire Rods

(Common, base)

*Per Gross Ton*

F.o.b. Pittsburgh .....$38.00
F.o.b. Cleveland ..... 38.00
F.o.b. Chicago ..... 39.00
F.o.b. Anderson, Ind. ..... 39.00
F.o.b. Youngstown ..... 39.00
F.o.b. Worcester, Mass. ..... 40.00
F.o.b. Birmingham ..... 41.00
F.o.b. San Francisco ..... 47.00
F.o.b. Galveston ..... 44.00

# Pig Iron and Ferroalloys

## PIG IRON

### PRICES PER GROSS TON AT BASING POINTS

| Basing Points | No. 2 Fdry. | Malleable | Basic | Bessemer |
|---|---|---|---|---|
| Everett, Mass. | $19.50 | $20.00 | $19.00 | $20.50 |
| Bethlehem, Pa. | 19.50 | 20.00 | 19.00 | 20.50 |
| Birdsboro, Pa. | 19.50 | 20.00 | 19.00 | 20.50 |
| Swedeland, Pa. | 19.50 | 20.00 | 19.00 | 20.50 |
| Steelton, Pa. | .... | .... | 19.00 | .... |
| Sparrows Point, Md. | 19.50 | .... | 19.00 | .... |
| Neville Island, Pa. | 18.50 | 18.50 | 18.00 | 19.00 |
| Sharpsville, Pa. | 18.50 | 18.50 | 18.00 | 19.00 |
| Youngstown | 18.50 | 18.50 | 18.00 | 19.00 |
| Buffalo | 18.50 | 19.00 | 17.50 | 19.50 |
| Erie, Pa. | 18.50 | 19.00 | 18.00 | 19.50 |
| Cleveland | 18.50 | 18.50 | 18.00 | 19.00 |
| Toledo, Ohio | 18.50 | 18.50 | 18.00 | 19.00 |
| Jackson, Ohio | 20.25 | 20.25 | 19.75 | .... |
| Detroit | 18.50 | 18.50 | 18.00 | 19.00 |
| Hamilton, Ohio | 18.50 | 18.50 | 18.00 | 19.00 |
| Chicago | 18.50 | 18.50 | 18.00 | 19.00 |
| Granite City, Ill. | 18.50 | 18.50 | .... | .... |
| Duluth, Minn. | 19.00 | 19.00 | .... | 19.50 |
| Birmingham | 14.50 | 14.50 | 13.50 | 19.00 |
| Provo, Utah | 17.50 | .... | 17.00 | .... |

### DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

| | No. 2 Fdry. | Malleable | Basic | Bessemer |
|---|---|---|---|---|
| Boston Switching District From Everett, Mass. | $20.00 | $20.50 | $19.50 | $21.00 |
| Brooklyn From East. Pa. | 21.9289 | 22.4289 | 21.9289 | 22.9289 |
| Newark or Jersey City, N. J. From East. Pa. | 20.9873 | 21.4873 | 20.4873 | 21.9873 |
| Philadelphia From Eastern Pa. | 20.3132 | 20.8132 | 19.8132 | 21.3132 |
| Cincinnati From Hamilton, Ohio | 19.51 | 19.51 | 19.01 | 20.01 |
| Canton, Ohio From Cleveland and Youngstown | 19.76 | 19.76 | 19.26 | 20.26 |
| Columbus, Ohio From Hamilton, Ohio | 20.50 | 20.50 | .... | .... |
| Mansfield, Ohio From Cleveland and Toledo | 20.26 | 20.26 | .... | .... |
| Indianapolis From Hamilton, Ohio | 20.93 | 20.93 | .... | .... |
| South Bend, Ind. From Chicago | 20.6935 | 20.6935 | .... | .... |
| Milwaukee From Chicago | 19.57 | 19.57 | .... | .... |
| St. Paul From Duluth | 20.94 | .... | .... | .... |
| Davenport, Iowa From Chicago | 20.3832 | 20.3832 | .... | .... |
| Kansas City From Granite City | 21.2178 | 21.2178 | .... | .... |

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

### LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.....$23.50

### GRAY FORGE PIG IRON

Valley furnace .....$18.00
Pittsburgh district furnace ..... 18.00

### CHARCOAL PIG IRON

Lake Superior furnace .....$21.00

Delivered Chicago ..... 24.2528

Delivered Buffalo ..... 24.57

### CANADA

#### Pig Iron

Per gross ton:

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75.....$21.00
No. 2 fdy., sil. 1.75 to 2.75..... 20.50
Malleable ..... 21.00

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75.....$22.50
No. 2 fdy., sil. 1.75 to 2.25..... 22.00
Malleable ..... 22.50
Basic ..... 22.00

## FERROALLOYS

### Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

*Per Gross Ton*

Domestic, 80% (carload) .....$85.00

### Spiegeleisen

*Per Gross Ton Furnace*

Domestic, 19 to 21% .....$26.00
50-ton lots 3-mo. shipment..... 24.00

### Electric Ferrosilicon

*Per Gross Ton Delivered*

50% (carloads) .....$77.50
50% (ton lots) ..... 85.00
75% (carloads) .....126.00
75% (ton lots) .....136.00

### Silvery Iron

F.o.b. Jackson, Ohio, Furnace

| *Per Gross Ton* | | *Per Gross Ton* | |
|---|---|---|---|
| 6% | $22.75 | 12% | $29.25 |
| 7% | 23.75 | 13% | 30.75 |
| 8% | 24.75 | 14% | 32.25 |
| 9% | 25.75 | 15% | 33.75 |
| 10% | 26.75 | 16% | 35.25 |
| 11% | 27.75 | 17% | 36.75 |

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

### Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

| *Per Gross Ton* | | *Per Gross Ton* | |
|---|---|---|---|
| 10% | $27.75 | 14% | $33.25 |
| 11% | 28.75 | 15% | 34.75 |
| 12% | 30.25 | 16% | 36.25 |
| 13% | 31.75 | 17% | 37.75 |

Manganese 1½ to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

### Other Ferroalloys

Ferrotungsten, per lb. contained W. del., carloads .....$1.35 to $1.45
Ferrotungsten, less carloads.. 1.45 to 1.55
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr. per lb. contained Cr. delivered, in carloads ..... 10.00c.
Ferrochromium, 2% carbon .....16.50c. to 17.00c.
Ferrochromium, 1% carbon .....17.50c. to 18.00c.
Ferrochromium, 0.10% carbon .....19.50c. to 20.00c.
Ferrochromium, 0.06% carbon .....20.00c. to 20.50c.
Ferrovanadium, del. per lb. contained V. .....$2.70 to $2.90
Ferrocarbontitanium, 15 to 18% Ti, 6 to 8% C. f.o.b. furnace carload and contract per net ton..$137.50
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton with $2 unitage .... 50.00
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton with $2.75 unitage ..... 65.00
Ferromolybdenum, per lb. Mo., del. 95c.
Calcium molybdate, per lb. Mo., del. ..... 80c.
Silico spiegel, per ton, f.o.b. furnace, car lots ..... $38.00
Ton lots or less per ton ..... 45.50
Silico-manganese, gross ton, delivered:
2.50% carbon grade ..... 90.00
2% carbon grade ..... 95.00
1% carbon grade ..... 105.00
Spot prices .....$5 a ton higher

# Iron and Steel Scrap .

## PITTSBURGH

**Per gross ton delivered consumers' yards:**

| | |
|---|---|
| No. 1 heavy melting steel | $11.50 to $12.00 |
| No. 2 heavy melting steel | 10.00 to 10.50 |
| No. 2 railroad wrought | 11.50 to 12.00 |
| Scrap rails | 13.00 to 13.50 |
| Rails, 3 ft. and under | 13.50 to 14.00 |
| Compressed sheet steel | 11.25 to 11.75 |
| Hand bundled sheet steel | 10.00 to 10.50 |
| Hvy. steel axle turnings | 10.00 to 10.50 |
| Machine shop turnings | 8.50 to 9.00 |
| Short shov. turnings | 8.00 to 8.50 |
| Short mixed borings and turnings | 6.00 to 6.50 |
| Cast iron borings | 6.00 to 6.50 |
| Cast iron carwheels | 12.00 to 12.50 |
| Heavy breakable cast | 11.50 to 12.00 |
| No. 1 cast | 13.00 to 13.50 |
| Railr. knuckles and couplers | 14.25 to 14.75 |
| Rail, coil and leaf springs | 14.25 to 14.75 |
| Rolled steel wheels | 14.25 to 14.75 |
| Low phos. billet crops | 15.00 to 15.50 |
| Low phos. sheet bar crops | 14.25 to 14.75 |
| Low phos. plate scrap | 14.00 to 14.50 |
| Low phos. punchings | 14.00 to 14.50 |
| Steel car axles | 14.25 to 14.75 |

## CHICAGO

**Delivered Chicago district consumers:**

| | *Per Gross Ton* |
|---|---|
| Heavy melting steel | $10.00 to $10.50 |
| Automobile hvy. melt. steel | 9.00 to 9.50 |
| Shoveling steel | 10.00 to 10.50 |
| Hydraulic comp. sheets | 9.00 to 9.50 |
| Drop forge flashings | 7.50 to 8.00 |
| No. 1 busheling | 8.25 to 8.75 |
| Rolled carwheels | 11.00 to 11.50 |
| Railroad tires | 11.50 to 12.00 |
| Railroad leaf springs | 10.50 to 11.00 |
| Axle turnings | 9.00 to 9.50 |
| Steel couplers and knuckles | 11.00 to 11.50 |
| Coil springs | 12.00 to 12.50 |
| Axle turnings (elec. fur.) | 9.50 to 10.00 |
| Low phos. punchings | 13.00 to 13.50 |
| Low phos. plates, 12 in. and under | 13.00 to 13.50 |
| Cast iron borings | 5.00 to 5.50 |
| Short shoveling turnings | 5.50 to 6.00 |
| Machine shop turnings | 5.00 to 5.50 |
| Rerolling rails | 11.00 to 11.50 |
| Steel rails, less than 3 ft. | 12.00 to 12.50 |
| Steel rails, less than 2 ft. | 13.00 to 13.50 |
| Angle bars, steel | 12.50 to 13.00 |
| Cast iron carwheels | 10.50 to 11.00 |
| Railroad malleable | 13.00 to 13.50 |
| Agricultural malleable | 9.50 to 10.00 |

| | *Per Net Ton* |
|---|---|
| Iron car axles | $14.50 to $15.00 |
| Steel car axles | 13.00 to 13.50 |
| No. 1 railroad wrought | 8.00 to 8.50 |
| No. 2 railroad wrought | 8.50 to 9.00 |
| No. 2 busheling | 4.50 to 5.00 |
| Locomotive tires, smooth | 10.00 to 10.50 |
| Pipe and flues | 5.00 to 5.50 |
| No. 1 machinery cast | 9.00 to 9.50 |
| Clean automobile cast | 8.50 to 9.00 |
| No. 1 railroad cast | 8.00 to 8.50 |
| No. 1 agricultural cast | 8.00 to 8.50 |
| Stove plate | 6.00 to 6.50 |
| Grate bars | 5.50 to 6.00 |
| Brake shoes | 6.00 to 6.50 |

## PHILADELPHIA

**Per gross ton delivered consumers' yards:**

| | |
|---|---|
| No. 1 heavy melting steel | *$9.50 to $10.50 |
| No. 2 heavy melting steel | *8.50 to 9.50 |
| No. 1 railroad wrought | 10.00 to 10.50 |
| Bundled sheets | 9.50 to 10.00 |
| Hydraulic compressed, new | 9.50 to 10.00 |
| Hydraulic compressed, old | 7.00 to 7.50 |
| Machine shop turnings | 5.50 to 6.00 |
| Heavy axle turnings | 8.50 to 9.00 |
| Cast borings | 5.00 to 5.50 |
| Stove plate (steel works) | 8.00 to 8.25 |
| Heavy breakable cast | 10.50 |
| No. 1 low phos. heavy | 13.75 to 14.25 |
| Couplers and knuckles | 13.50 to 14.00 |
| Rolled steel wheels | 13.50 to 14.00 |
| No. 1 blast furnace | 4.75 to 5.00 |
| Spec. iron and steel pipe | 8.00 to 8.50 |
| Shafting | 17.00 |
| Steel axles | 16.00 |
| No. 1 forge fire | 9.50 to 10.00 |
| Cast iron carwheels | 11.00 to 11.50 |
| No. 1 cast | 11.00 to 11.50 |
| Cast borings (chem.) | 12.00 to 14.00 |
| Steel rails for rolling | 12.00 to 12.50 |

* Brokers' buying price for export.

## CINCINNATI

**Dealers' buying prices per gross ton:**

| | |
|---|---|
| No. 1 heavy melting steel | $8.00 to $8.50 |
| No. 2 heavy melting steel | 6.50 to 7.00 |
| Scrap rails for melting | 8.00 to 8.50 |
| Loose sheet clippings | 4.50 to 5.00 |
| Bundled sheets | 6.00 to 6.50 |
| Cast iron borings | 4.50 to 5.00 |
| Machine shop turnings | 4.50 to 5.00 |
| No. 1 busheling | 6.00 to 6.50 |
| No. 2 busheling | 2.75 to 3.25 |
| Rails for rolling | 9.00 to 9.50 |
| No. 1 locomotive tires | 7.25 to 7.75 |
| Short rails | 11.50 to 12.00 |
| Cast iron carwheels | 8.00 to 8.50 |
| No. 1 machinery cast | 9.25 to 9.75 |
| No. 1 railroad cast | 8.50 to 9.00 |
| Burnt cast | 6.00 to 6.50 |
| Stove plate | 6.00 to 6.50 |
| Agricultural malleable | 8.00 to 8.50 |
| Railroad malleable | 9.00 to 9.50 |

## CLEVELAND

**Per gross ton delivered consumers' yards:**

| | |
|---|---|
| No. 1 heavy melting steel | $10.00 to $10.50 |
| No. 2 heavy melting steel | 9.50 to 10.00 |
| Compressed sheet steel | 9.75 to 10.25 |
| Light bundled sheet stampings | 8.00 to 8.50 |
| Drop forge flashings | 9.50 to 10.00 |
| Machine shop turnings | 6.25 to 6.75 |
| Short shoveling turnings | 6.50 to 7.00 |
| No. 1 busheling | 9.50 to 10.00 |
| Steel axle turnings | 9.50 to 10.00 |
| Low phos. billet crops | 14.00 to 14.50 |
| Cast iron borings | 6.50 to 7.00 |
| Mixed borings and short turnings | 6.50 to 7.00 |
| No. 2 busheling | 6.50 to 7.00 |
| No. 1 cast | 11.50 to 12.00 |
| Railroad grate bars | 7.00 to 7.50 |
| Stove plate | 7.50 to 8.00 |
| Rails under 3 ft. | 14.00 to 14.50 |
| Rails for rolling | 15.50 to 18.00 |
| Railroad malleable | 13.50 to 14.00 |
| Cast iron carwheels | 10.75 to 11.00 |

## BUFFALO

**Per gross ton, f.o.b. Buffalo consumers' plants:**

| | |
|---|---|
| No. 1 heavy melting steel | $11.00 |
| No. 2 heavy melting scrap | 10.00 |
| Scrap rails | 11.00 |
| New hydraul. comp. sheets | 10.00 |
| Old hydraul. comp. sheets | 9.00 |
| Drop forge flashings | 10.00 |
| No. 1 busheling | 10.00 |
| Hvy. steel axle turnings | $8.00 to 8.50 |
| Machine shop turnings | 4.50 to 5.00 |
| Knuckles and couplers | 11.50 to 12.00 |
| Coil and leaf springs | 11.50 to 12.00 |
| Rolled steel wheels | 11.50 to 12.00 |
| Low phos. billet crops | 12.00 to 12.50 |
| Short shov. steel turnings | 6.00 to 6.50 |
| Short mixed borings and turnings | 6.00 to 6.50 |
| Cast iron borings | 6.00 to 6.50 |
| No. 2 busheling | 6.50 |
| Steel car axles | 11.50 to 12.00 |
| Iron axles | 11.50 to 12.00 |
| No. 1 machinery cast | 11.50 to 12.50 |
| No. 1 cupola cast | 10.50 to 11.00 |
| Stove plate | 9.00 to 9.50 |
| Steel rails, 3 ft. and under | 12.50 to 13.00 |
| Cast iron carwheels | 11.00 to 11.50 |
| Industrial malleable | 12.00 to 13.00 |
| Railroad malleable | 12.00 to 13.00 |
| Chemical borings | 8.00 to 8.50 |

## BOSTON

**Dealers' buying prices per gross ton:**

| | |
|---|---|
| *No. 1 heavy melting steel | $8.50 |
| No. 1 heavy melting steel | $6.15 to 6.65 |
| *Scrap T rails | 8.50 to 8.75 |
| Scrap rails | 6.40 to 6.65 |
| *No. 2 steel | 7.50 |
| No. 2 steel | 5.15 to 5.65 |
| Breakable cast | 5.00 to 5.50 |
| Machine shop turnings | 2.25 to 2.40 |
| *Machine shop turnings (short) | 4.25 to 4.50 |
| Burd'ed skeleton, long | 5.00 to 5.25 |
| Forge flashings | 5.00 to 5.50 |
| Shafting | 11.75 to 12.00 |
| Steel car axles | 11.50 to 12.00 |
| Cast iron borings, chemical | 6.50 to 7.00 |
| *Stove plate | 6.25 to 6.50 |

**Per gross ton delivered consumers' yards:**

| | |
|---|---|
| Textile cast | $9.00 to $9.50 |
| No. 1 machinery cast | 9.00 to 9.50 |
| Stove plate | 6.00 to 6.50 |
| Railroad malleable | 11.00 to 11.50 |

* Delivered local army base.

## NEW YORK

**Dealers' buying prices per gross ton:**

| | |
|---|---|
| No. 1 heavy melting steel | *$7.00 to †$8.50 |
| No. 2 heavy melting steel | *5.50 to †7.00 |
| Heavy breakable cast | 6.25 to 6.75 |
| No. 1 machinery cast | 7.00 to 7.50 |
| No. 2 cast | †6.25 |
| Stove plate | †6.25 |
| Steel car axles | 13.50 to 14.00 |
| No. 1 railroad wrought | 7.00 to 7.50 |
| No. 1 yard wrought, long | 6.00 to 6.50 |
| Spec. iron and steel pipe | 4.50 to 5.00 |
| Forge fire | 5.50 to 6.00 |
| Rails for rolling | 8.50 to 9.00 |
| Short shoveling turnings | 2.00 to 2.50 |
| Machine shop turnings | 2.00 to 2.50 |
| Cast borings | 3.50 to 3.75 |
| No. 1 blast furnace | 2.00 to 2.50 |
| Cast borings (chemical) | 11.00 to 11.50 |
| Unprepared yard iron and steel | 4.00 to 4.50 |

**Per gross ton, delivered local foundries:**

| | |
|---|---|
| No. 1 machinery cast | $10.00 |
| No. 1 hvy. cast (cupola size) | 9.00 |
| No. 2 cast | 7.50 |

* For direct car loading only.
† Loading on barge.

## BIRMINGHAM

**Per gross ton delivered consumers' yards:**

| | |
|---|---|
| Heavy melting steel | $9.00 to $9.50 |
| Scrap steel rails | 10.00 to 10.50 |
| Short shoveling turnings | 7.00 |
| Stove plates | 7.00 |
| Steel axles | 11.50 |
| Iron axles | 11.50 |
| No. 1 railroad wrought | 7.00 |
| Rails for rolling | 12.50 |
| No. 1 cast | 9.50 to 10.00 |
| Tramcar wheels | 10.00 |

## ST. LOUIS

**Per gross ton delivered consumers' yards:**

| | |
|---|---|
| Selected heavy steel | $8.75 to $9.25 |
| No. 1 heavy melting | 8.25 to 8.75 |
| No. 2 heavy melting | 7.50 to 8.00 |
| No. 1 locomotive tires | 9.75 to 10.25 |
| Misc. stand-sec. rails | 9.75 to 10.25 |
| Railroad springs | 10.75 to 11.25 |
| Bundled sheets | 6.00 to 6.50 |
| No. 2 railroad wrought | 8.25 to 8.75 |
| No. 1 busheling | 5.00 to 5.50 |
| Cast iron borings and shoveling turnings | 3.00 to 3.50 |
| Rails for rolling | 10.00 to 10.50 |
| Machine shop turnings | 2.75 to 3.25 |
| Heavy turnings | 5.50 to 6.00 |
| Steel car axles | 12.50 to 13.00 |
| Iron car axles | 15.00 to 16.00 |
| No. 1 railroad wrought | 6.00 to 6.50 |
| Steel rails less than 3 ft. | 11.50 to 12.00 |
| Steel angle bars | 9.50 to 10.00 |
| Cast iron carwheels | 7.50 to 8.00 |
| No. 1 machinery cast | 8.50 to 9.00 |
| Railroad malleable | 10.50 to 11.00 |
| No. 1 railroad cast | 8.00 to 8.50 |
| Stove plate | 6.50 to 7.00 |
| Agricult. malleable | 8.50 to 9.00 |

## DETROIT

**Dealers' buying prices per gross ton:**

| | |
|---|---|
| Heavy melting steel | $7.50 to $8.00 |
| Borings and short turnings | 4.25 to 4.75 |
| Long turnings | $3.50 to $4.00 |
| No. 1 machinery cast | 10.75 to 11.25 |
| Automotive cast | 11.25 to 11.75 |
| Hydraul. comp. sheets | 8.00 to 8.50 |
| Stove plate | 6.50 to 7.00 |
| New factory busheling | 6.75 to 7.25 |
| Old No. 2 busheling | 3.75 to 4.25 |
| Sheet clippings | 4.75 to 5.25 |
| Flashings | 7.25 to 7.75 |
| Low phos. plate scrap | 7.75 to 8.25 |

## CANADA

**Dealers' buying prices per gross ton:**

| | Toronto | Montreal |
|---|---|---|
| Heavy melting steel | $7.00 | $7.00 |
| Rails scrap | 8.00 | 8.00 |
| Machine shop turnings | 3.00 | 3.00 |
| Boiler plate | 4.50 | 4.50 |
| Heavy axle turnings | 4.50 | 4.00 |
| Cast borings | 4.00 | 3.50 |
| Steel borings | 2.00 | 2.00 |
| Wrought pipe | 3.50 | 3.50 |
| Steel axles | 7.00 | 8.00 |
| Axles, wrought iron | 7.00 | 8.00 |
| No. 1 machinery cast | 9.00 | 9.00 |
| Stove plate | 5.50 | 5.00 |
| Standard carwheels | 7.25 | 7.00 |
| Malleable | 6.75 | 7.00 |

# ORES, FLUORSPAR, COKE, FUEL, REFRACTORIES

## Lake Superior Ores

*Delivered Lower Lake Ports*

| | *Per Gross Ton* |
|---|---|
| Old range, Bessemer, 51.50% iron | $4.80 |
| Old range, non-Bessemer, 51.50% iron | 4.65 |
| Mesabi, Bessemer, 51.50% iron | 4.65 |
| Mesabi, non-Bessemer, 51.50% iron | 4.50 |
| High phosphorus, 51.50% iron | 4.40 |

## Foreign Ore

*C.i.f. Philadelphia or Baltimore*

| | *Per Unit* |
|---|---|
| Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algeria | 9.50c. |
| Iron, low phos., Swedish, average 68½% iron | 9.50c. |
| Iron, basic or foundry, Swedish, aver. 65% iron | 9c. |
| Iron, basic or foundry, Russian, aver. 65% iron | 9c. |
| Manganese, Caucasian, washed 52% | 26c. |
| Manganese, African, Indian, 44-48% | 21c |
| Manganese, African, Indian, 49-51% | 24c. |
| Manganese, Brazilian, 46 to 48½% | 20c. |

| | *Per Net Ton Unit* |
|---|---|
| Tungsten, Chinese, wolframite, duty paid, delivered* | $17.50 to $18.50 |
| Tungsten, domestic, scheelite, delivered† | 17.00 |

| | *Per Gross Ton* |
|---|---|
| Chrome, 45%, $Cr_2O_3$, crude, c.i.f. Atlantic Seaboard | $17.00 |
| Chrome, 48%, $Cr_2O_3$, c.i.f. Atlantic Seaboard | 20.00 |

* Quotations nominal in absence of sales.
† Nominal; no supplies available.

## Fluorspar

| | *Per Net Ton* |
|---|---|
| Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines for all-rail shipment | $13.00 |
| Same grade for Ohio River barge shipment for Kentucky and Illinois River landings | 16.00 |
| No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines | 14.00 |
| Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid | 19.00 |
| Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines | 30.00 |

## COKE, COAL AND FUEL OIL

### Coke

| | *Per Net Ton* |
|---|---|
| Furnace, f.o.b. Connellsville Prompt | $3.85 |
| Foundry, f.o.b. Connellsville Prompt | $4.60 to 5.10 |
| Foundry, by-product, Chicago ovens, for delivery outside switching district | 8.50 |
| Foundry, by-product, delivered in Chicago switching district | 9.25 |
| Foundry, by-product, New England, delivered | 11.00 |
| Foundry, by-product, Newark or Jersey City, c.i.f. | 9.24 to 9.72 |
| Foundry, by-product, Phila. | 9.03 |
| Foundry, by-product, Cleveland, delivered | $9.25 |
| Foundry, Birmingham | 6.00 |
| Foundry, by-product, St. Louis, f.o.b. ovens | 8.00 |
| Foundry, by-product, del'd St. Louis | 9.00 |

### Coal

| | *Per Net Ton* |
|---|---|
| Mine run steam coal, f.o.b. W. Pa. mines | $1.80 to $2.05 |
| Mine run coking coal, f.o.b. W. Pa. | 2.05 to 2.25 |
| Gas coal, ¾-in., f.o.b. Pa. mines | 2.25 to 2.55 |
| Mine run gas coal, f.o.b. Pa. mines | 2.05 to 2.45 |
| Steam slack, f.o.b. W. Pa. mines | 1.55 to 1.65 |
| Gas slack, f.o.b. W. Pa. mines | 1.90 to 2.10 |

### Fuel Oil

| | *Per Gal. f.o.b. Bayonne, N. J.* |
|---|---|
| No. 3 distillate | 4.00c. |
| No. 4 industrial | 3.50c. |

| | *Per Gal. f.o.b. Baltimore* |
|---|---|
| No. 3 distillate | 4.00c. |
| No. 4 industrial | 3.50c. |

| | *Per Gal. del'd Chicago* |
|---|---|
| No. 3 industrial fuel oil | 3.88c. |
| No. 5 industrial fuel oil | 3.38c. |

| | *Per Gal. f.o.b. Cleveland* |
|---|---|
| No. 3 distillate | 5.50c. |
| No. 4 industrial | 5.25c. |
| No. 5 industrial | 4.25c. |

## REFRACTORIES

### Fire Clay Brick

| | *Per 1000 f.o.b. Works* High-heat Duty Brick | Intermediate Duty Brick |
|---|---|---|
| Pennsylvania | $45.00 | $40.00 |
| Maryland | 45.00 | 40.00 |
| New Jersey | 55.00 | 42.00 |
| Ohio | 45.00 | 40.00 |
| Kentucky | 45.00 | 40.00 |
| Missouri | 45.00 | 40.00 |
| Illinois | 45.00 | 40.00 |
| Ground fire clay, per ton | 7.00 | |

### Silica Brick

| | *Per 1000 f.o.b. Works* |
|---|---|
| Pennsylvania | $45.00 |
| Chicago District | 54.00 |
| Birmingham | 55.00 |
| Silica clay, per net ton | 8.00 |

### Chrome Brick

| | *Per Net Ton* |
|---|---|
| Standard, f.o.b. Baltimore, Plymouth Meeting and Chester, Pa. | $45.00 |
| Chemically Bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa. | 42.50 |

### Magnesite Brick

| | *Per Net Ton* |
|---|---|
| Standard, f.o.b. Baltimore and Chester, Pa. | $65.00 |
| Chemically Bonded, f.o.b. Baltimore | 55.00 |

### Grain Magnesite

| | *Per Net Ton* |
|---|---|
| Imported, f.o.b. Baltimore and Chester, Pa. | $45.00 |
| Domestic, f.o.b. Baltimore and Chester | 40.00 |
| Domestic, f.o.b. Chewelah, Wash. | 22.00 |

# Warehouse Prices for Steel Products

## PITTSBURGH

Base per Lb.

Plates ..... 3.15c.
Structural shapes ..... 3.15c.
Soft steel bars and small shapes... 2.90c.
Reinforcing steel bars ..... 2.90c.
Cold-finished and screw stock:
Rounds and hexagons ..... 3.20c.
Squares and flats ..... 3.20c.
Hoops and bands under ¼ in..... 3.20c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles ..... 3.30c.
Galv. sheets (No. 24), 25 or more bundles ..... 3.95c.
Hot-rolled sheets (No. 10)..... 2.95c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)..... $3.69
Spikes, large ..... 2.90c.
Track bolts, all sizes, per 100 count, 65 per cent off list.
Machine bolts, 100 counts, 65 per cent off list.
Carriage bolts, 100 count, 65 per cent off list.
Nuts, all styles, 100 count, 65 per cent off list.
Large rivets, base per 100 lb. ..... $3.50
Wire, black, soft ann'l'd, base per 100 lb. ..... *2.70
Wire, galv. soft, base per 100 lb...*2.925
Common wire nails, per keg.....*2.834
Cement coated nails, per keg.....*2.834

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lb.

*Delivered in Pittsburgh switching district.

## CHICAGO

Base per Lb.

Plates and structural shapes..... 3.20c.
Soft steel bars ..... 2.95c.
Cold-fin. steel bars:
Rounds and hexagons ..... 3.35c.
Flats and squares ..... 3.35c.
Hot-rolled strip ..... 3.30c.
Hot-rolled annealed sheets (No. 24) 3.85c.
Galv. sheets (No. 24)..... 4.55c.
Hot-rolled sheets (No. 10) ..... 3.05c.
Spikes (keg lots) ..... 3.50c.
Track bolts (keg lots) ..... 4.65c.
Rivets, structural (keg lots) ..... 3.65c.
Rivets, boiler (keg lots) ..... 3.75c.

Per Cent Off List

Machine bolts ..... *70
Carriage bolts ..... *70
Lag screws ..... *70
Hot-pressed nuts, sq. tap. or Hot-pressed nuts, sq. tap or blank.. *70
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank.. *70
Hex. head cap screws..... 80
Cut point set screws .....70 and 10
Flat head bright wood screws..37½ and 10
Spring cotters ..... 50
Store bolts in full packages..... 70
Rd. hd. tank rivets, 7/16 in. and smaller ..... 57½
Wrought washers ..... $4.50 off list
Black ann'l'd wire per 100 lb.....$3.85
Com. wire nails, base per keg..... 2.95†
Cement c't'd nails, base per keg.... 2.95†

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 65 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

†Prices for city and suburbs only.

## NEW YORK

Base per Lb.

Plates, ¼ in. and heavier..... 3.40c.
Structural shapes ..... 3.37c.
Soft steel bars, small shapes ..... 3.26c.
Iron bars ..... 3.26c.
Iron bars, swed. charcoal ..... 6.50c.
Cold-fin. shafting and screw stock:
Rounds and hexagons ..... 3.81c.
Flats and squares ..... 4.31c.
Cold-rolled; strip, soft and quarter hard ..... 3.36c.
Hoops ..... 3.56c.
Bands ..... 3.56c.
Hot-rolled sheet (No. 10)..... 3.31c.
Hot-rolled ann'l'd sheets (No. 24*) 3.89c.
Galvanized sheets (No. 24*) ..... 4.50c.
Long terne sheets (No. 24) ..... 5.20c.
Standard tool steel ..... 11.00c.
Wire, black annealed (No. 10)..... 3.40c.
Wire, galv. (No. 10) ..... 3.75c.
Tire steel, 1 x ⅛ in. and larger.... 3.65c.
Open hearth spring steel..4.00c. to 10.00c.
Common wire nails, base, per keg..$3.21

Per Cent

Machine bolts, cut thread: Off List
All diameters .....65 and 10
Carriage bolts, cut thread:
All diameters .....65 and 10

Per 100 Ft.

Boiler tubes:
Lap welded, 2-in. .....$18.05
Seamless welded, 2-in. ..... 19.24
Charcoal iron, 2-in. ..... 24.94
Charcoal iron, 4-in. ..... 63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

## ST. LOUIS

Base per Lb.

Plates and struc. shapes ..... 3.44c.
Bars, soft steel or iron ..... 3.19c.
Cold-fin. rounds, shafting, screw stocks ..... 3.74c.
Hot-rolled annealed sheets (No. 24) 4.09c.
Galv. sheets (No. 24) ..... 4.64c.
Hot-rolled sheets (No. 10) ..... 3.29c
Black corrug. sheets (No. 24)..... 4.09c.
*Galv. corrug. sheets ..... 4.64c.
Structural rivets ..... 3.99c.
Boiler rivets ..... 4.09c.

Per Cent Off List

Tank rivets, 7/16 in. and smaller.... 55
Machine and carriage bolts, lag screws fittings up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts:
All quantities ..... 70

*No. 26 and lighter take special prices.

## PHILADELPHIA

Base per Lb.

*Plates, ¼-in. and heavier ..... 2.98c.
*Structural shapes ..... 2.98c.
*Soft steel bars, small shapes, iron bars (except bands) ..... 2.93c.
†Reinforc. steel bars, sq. twisted and deformed ..... 2.96c.
Cold-finished steel bars ..... 3.61c.
*Steel hoops ..... 3.43c.
*Steel bands, No. 12 and 3/16 in., incl. ..... 3.18c.
Spring steel ..... 5.00c.
†Hot-rolled anneal. sheets (No. 24) 3.65c.
†Galvanized sheets (No. 24)..... 4.30c.
*Hot-rolled annealed sheets (No. 10 ..... 3.08c.
Diam. pat. floor plates, ¼ in..... 4.95c.
Swedish iron bars ..... 6.25c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 50 bundles or over.

‡For less than 2000 lb.

## CLEVELAND

Base per Lb.

Plates and struc. shapes ..... 3.31c.
Soft steel bars ..... 2.95c.
Reinforc. steel bars ..... 2.10c.
Cold-finished steel bars ..... 3.25c.
Flat-rolled steel under ¼ in. ..... 3.36c.
Cold-finished strip .....†3.00c.
Hot-rolled annealed sheets (No. 24) 3.96c.
Galvanized sheets (No. 24) ..... 4.61c.
Hot-rolled sheets (No. 10) ..... 3.11c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets ..... 3.56c.
Black ann'l'd wire, per 100 lb.....$2.65
No. 9 galv. wire, per 100 lb..... 3.00
Com. wire nails, base per keg..... 2.40

†Outside delivery 10c. less.

## CINCINNATI

Base per Lb.

Plates and struc. shapes ..... 3.42c.
Bars, soft steel or iron..... 3.17c.
New billet reinforc. bars ..... 3.25c.
Rail steel reinforc. bars ..... 3.25c.
Hoops and bands, 3/16 in. and lighter ..... 3.47c.
Cold-finished bars .....3.57c.
Hot-rolled annealed sheets (No. 24) 4.02c.
Galv. sheets (No. 24) ..... 4.72c.
Hot-rolled sheets (No. 10) ..... 3.22c.
Structural rivets ..... 4.35c.
Small rivets .....55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over) .....$2.88
Com. wire nails, base per keg:
Any quantity less than carload..... 3.04
Cement c't'd nails, base 100-lb. keg 3.50
Chain, 1-in., per 100 lb. ..... 8.35

Net per 100 Ft.

Seamless steel boiler tubes, 2-in... $21.67
4-in. ..... 51.19
Lap-welded steel boiler tubes, 2-in. 20.62
4-in. ..... 48.19

## BUFFALO

Base per Lb.

Plates ..... 3.37c.
Struc. shapes ..... 3.25c.
Soft. steel bars ..... 3.00c.
Reinforcing bars ..... 2.60c.
Cold-fin. flats and sq. ..... 3.55c.
Round and hex. ..... 3.55c.
Cold-rolled strip steel ..... 3.19c.
Hot-rolled annealed sheets (No. 24) 4.05c.
Heavy hot-rolled sheets, 3/16 in., 24 to 48 in. wide ..... 3.62c.
Galv. sheets (No. 24) ..... 4.70c.
Bands ..... 3.42c.
Hoops ..... 3.42c.
Hot-rolled unannealed sheets ..... 3.17c.
Com. wire nails, base per keg.....$3.35
Black wire, base per 100 lb. ..... 3.55

## BOSTON

Base per Lb.

Beams, channels, angles, tees, zees 3.55c.
H beams and shapes ..... 3.55c.
Plates—sheered, tank and univ. mill, ¼ in. thick and heavier ..... 3.56c.
Floor plates, diamond pattern ..... 5.36c.
Bar and bar shapes (mild steel).. 3.35c.
Bands 3/16 in. thick and No. 12 ga. incl. .....3.65c. to 4.65c.
Half rounds, half ovals, ovals and bevels ..... 4.60c.
Tire steel ..... 4.60c.
Cold-rolled strip steel .....3.245c.
Cold-finished rounds, squares and hexagons ..... 3.90c.
Cold-finished flats ..... 3.75c.
Blue annealed sheets, No. 10 ga... 3.65c.
One pass cold-rolled sheets No. 24 ga. ..... 4.20c.
Galvanized steel sheets, No. 24 ga. 4.90c.
Lead coated sheets, No. 24 ga. .... 5.85c.

Prices delivered by truck in metropolitan Boston, subject to quantity differentials.

## MILWAUKEE

Base per Lb.

Plates and structural shapes ..... 3.31c.
Soft steel bars ..... 3.06c.
Hot-rolled strip ..... 3.41c.
Hot-rolled sheets (No. 10)..... 3.16c.
Hot-rolled annealed sheets (No. 24) 3.96c.
Galvanized sheets (No. 24) ..... 4.66c.
Cold-finished steel bars ..... 3.61c.
Cold-rolled strip ..... 3.30c.
Structural rivets (keg lots) ..... 3.86c.
Boiler rivets (keg lots) ..... 3.96c.
Track spikes (keg lots) ..... 3.71c.
Track bolts (keg lots) ..... 4.86c.
Black annealed wire ..... 3.10c.
Com. wire nails ..... 2.90c.
Cement coated nails ..... 2.90c.

Per Cent Off List

Machine bolts ..... 70
Carriage bolts ..... 70
Hot-pressed nuts, sq. and hex., tapped or blank (keg lots) ..... 70

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on order of 400 to 3499 lb. On cold-finished bars the prices are for orders of 300 to 499 lb.

## PACIFIC COAST

Base per Lb.

| | San Francisco | Los Angeles | Seattle |
|---|---|---|---|
| Plates, tank and U. M. | 3.55c. | 3.60c. | 3.55c. |
| Shapes, standard | 3.55c. | 3.60c. | 3.55c. |
| Soft steel bars | 3.60c. | 3.60c. | 3.60c. |
| Reinforcing bars, f.o.b. cars dock Pacific ports | 2.45c. | 2.45c. | 2.45c. |
| Hot rolled annealed sheets (No. 24) | 4.40c. | 4.35c. | 4.40c. |
| Hot-rolled sheets (No. 10) | 3.75c. | 3.70c. | 3.75c. |
| Galv. sheets (No. 24) | 5.00c. | 4.95c. | 5.00c. |
| Cold finished steel: | | | |
| Rounds | 5.95c. | 5.85c. | 6.00c. |
| Squares and hexagons | 7.20c. | 7.10c. | 7.25c. |
| Flats | 7.70c. | 7.60c. | 8.25c. |
| Common wire nails —base per keg less carload | $3.30 | $3.40 | $3.30 |

All items subject to differentials for quantity.

## TOOL STEEL

Prices are same for warehouse distribution at all points on or East of Mississippi River. West of Mississippi quotations are 1c. a lb. higher.

Base per Lb.

High speed ..... 57c.
High carbon chrome ..... 37c.
Oil hardening ..... 22c.
Extra ..... 17c.
Regular ..... 14c.

# Weekly Indications of Steel Activity

## From The Iron Age

| | May 28, 1935 | May 21, 1935 | Apr. 30, 1935 | May 29, 1934 | Average, Year to Date, 1935 | 1934 |
|---|---|---|---|---|---|---|
| Steel ingot operations—Per cent of capacity | 42.5 | 43.0 | 46.0 | 59.0 | 47.8 | 46.75 |

| | Week Ended May 28, 1935 | May 21, 1935 | Apr. 30, 1935 | May 29, 1934 | Year to Date 1935 | 1934 |
|---|---|---|---|---|---|---|
| Fabricated structural steel awards | 6,250 | 13,800 | 15,250 | 11,800 | 283,738 | 343,595 |
| Fabricated plate awards | 2,175 | 1,912 | 500 | 2,030 | 42,067 | 49,477 |
| Sheet steel piling awards | 2,150 | 6,830 | 0 | 150 | 22,145 | 20,820 |
| Reinforcing bar awards | 5,040 | 3,500 | 2,800 | 5,200 | 97,770 | 89,570 |

# Fabricated Structural Steel

## Lettings Small—New Projects in Good Volume

WITH the exception of 1000 tons for cranes for the Youngstown Sheet & Tube Co., Gary, Ind., awards of 6250 tons are all in small lots and compare with 13,800 tons last week. New projects of 28,000 tons are the third largest this year and compare with 6700 tons in the previous week and 18,125 tons two weeks ago. The Hendrik Hudson bridge over the Harlem River in New York, requiring 6000 tons, is the outstanding new project. Main gates for the Bonneville Dam, Bonneville, Wash., call for 5000 tons, and trestle work at Odair, Wash., 4150 tons. Plate lettings total 2175 tons. Sheet piling awards of 2150 tons include 1700 tons for a levee wall at Monroe, La. Structural steel awards for the week follow:

### STRUCTURAL STEEL AWARDS

#### NORTH ATLANTIC STATES

**Rome, N. Y.,** 140 tons, building for State school, to Utica Structural Steel Co.

**Syracuse, N. Y.,** 200 tons, livestock building, to Belmont Iron Works.

**Oneida County, N. Y.,** 100 tons, highway bridge, to McClintic-Marshall Corpn.

**Blue Plains, D. C.,** 150 tons, sewage pumping station, to Ingalls Iron Works Co.

**Ruppert, Pa.,** 100 tons, bridge for Reading Railroad, to McClintic-Marshall Corpn.

#### THE SOUTH

**State of Tennessee,** 500 tons, transmission towers for TVA, to Blaw-Knox Co.

**Nashville, Tenn.,** 400 tons, Kress store, to Ingalls Iron Works Co.

**Athens, Ala.,** 670 tons, Elk River bridge, to Virginia Bridge & Iron Co.

**New Orleans,** 185 tons, State highway bridge, to McClintic-Marshall Corpn.

**Wichita County, Tex.,** 395 tons, bridge, to Austin Brothers Bridge Co.

#### CENTRAL STATES

**Chicago,** 110 tons, industrial building, to Duffin Iron Works.

**State of Minnesota,** 165 tons, bridge, to Minneapolis-Moline Power Implement Co.

**Smith County, Kan.,** 170 tons, bridge, to St. Joseph Structural Steel Co.

**Marion County, Ind.,** 400 tons, State highway bridge, to McClintic-Marshall Corpn.

**Gary, Ind.,** 1000 tons, cranes for American Sheet & Tin Plate Co., to Harnischfeger Corpn.

**Stickney, Ill.,** 750 tons, sewage plant, to Duffin Iron Works.

#### WESTERN STATES

**Huntington Park, Cal.,** 100 tons, school, to Western Iron & Metal Co.

**Almira, Wash.,** 220 tons, cofferdam bracing on Grand Coulee project, to Pacific Coast Steel Corpn.

**Almira,** 120 tons, tunnel work on Grand Coulee project, to Isaccson Iron Works.

**Long Beach, Cal.,** 100 tons, Benjamin Franklin school, to Virginia Bridge & Iron Co.

**Moore Island, Cal.,** 375 tons, gantry cranes, to Star Iron & Steel Co.

### NEW STRUCTURAL STEEL PROJECTS

#### NORTH ATLANTIC STATES

**Somerville, Mass.,** 150 tons, post office.

**New York,** 6000 tons, Harlem River bridge for Hendrik Hudson Bridge Authority; general contract bids June 14.

**Brooklyn,** 400 tons, building for American Molasses Co.

**Haverstraw, N. Y.,** 200 tons, high school.

**Rahway, N. J.,** 520 tons, office building for Merck & Co.

**Pittsburgh,** 750 tons, Liberty tubes tolls plaza.

**Hays, Pa.,** 200 tons, loading plant for American Oil Co.

**Lewisburg, Pa.,** unstated tonnage, building for Bucknell College.

**Amcelle, Md.,** 250 tons, building for Celanese Corpn.

#### THE SOUTH

**Park View, W. Va.,** 275 tons, trash racks.

**Norfolk, Va.,** 440 tons, plates and small shapes for ferryboat; bids now being entered with Norfolk County Ferry Co.

**Houma, La.,** 200 tons, bridge.

#### CENTRAL STATES

**Cleveland,** 100 tons, building for Grasselli Chemical Co.

**Cleveland,** 100 tons, Hawthornden Farm building, Cleveland State Hospital; Robert Evans Co., Canton, contractor.

**Hiram, Ohio,** 100 tons, college building.

**Elyria, Ohio,** 150 tons, building for Western Automatic Machine Screw Co.; former bids calling for 450 tons rejected and plans revised.

**Zanesville, Ohio,** 110 tons, Pleasant Hill and Atwood dams in Muskingum District Conservancy project; bids June 12 and 13.

**St. Louis,** 7000 tons, superstructure of post office; Great Lakes Construction Co., Chicago, low bidder on general contract.

**Blodgett, Ill.,** 700 tons, bridge.

**Chicago,** 100 tons, bridge across Bubbly Creek.

**Chicago,** 475 tons, Liquid Carbonic Corpn.

**State of Illinois,** 1000 tons, bridges.

**Milwaukee Road,** 170 tons, highway bridge at Lake Wisconsin.

**Chicago & North Western Railway,** 350 tons, bridge No. 1048 at West Allis, Wis.; Bates & Rogers Construction Co., low bidder.

**State of Missouri,** 510 tons; 390 tons, bridge over Meramec River near St. Louis, 120 tons for six small bridges in city; bids to be opened June 7 by State Highway Commission.

**State of Missouri,** 875 tons, bridges.

#### WESTERN STATES

**Southern Pacific Co.,** 160 tons, bridge at Capitan, Cal.

**Monterey County, Cal.,** 157 tons, State bridges; bids June 12.

**San Francisco,** 100 tons, factory for Betts Spring Co.

**Los Angeles,** 100 tons, crane runway for Department of Water and Power; Consolidated Steel Corpn. low bidder.

**San Pedro, Cal.,** 500 tons, post office; bids June 30.

**Vernon, Cal.,** 250 tons, addition to glass plant; bids soon.

**Lodi, Cal.,** 100 tons, post office; plans being prepared.

**Spokane, Wash.,** 440 tons; city dam, plans being completed.

**Odair, Wash.,** 4150 tons, trestle.

**Almira, Wash.,** 2600 tons, construction trestle on Grand Coulee project.

**Almira,** 700 tons, cement silos on Grand Coulee project; bids under advisement.

**Lakeview, Wash.,** 183 tons, State undercrossing; general contract awarded.

**Bonneville, Ore.,** 5000 tons, main gates for Bonneville dam; bids late in June.

### FABRICATED PLATE

#### AWARDS

**Park View, W. Va.,** 1075 tons, conduits for United States Engineers, to Treadwell Construction Co.

**Fort Peck, Mont.,** 650 tons, pipe, to Taylor Forge & Pipe Co.

**Memphis, Tenn.,** 350 tons, 32-in. dredge pipe, to Treadwell Construction Co.

**South Pasadena, Cal.,** 100 tons, city tank, to Pittsburgh-Des Moines Steel Co.

#### NEW PROJECTS

**Washington,** 990 tons, for various Navy yards; bids to be taken June 18 by Bureau of Supplies and Accounts, Navy Department.

**Norfolk, Va.,** 290 tons of plates and 150 tons of angles for ferry boat for Norfolk County Ferry Co.

**Mammoth, Yellowstone National Park, Wyo.,** 350 tons, pipe line; Steel Tank & Pipe Co. low bidder.

**Palo Alto, Cal.,** 100 tons, pipe line at Stanford University.

### SHEET PILING

#### AWARDS

**Monroe, La.,** 1700 tons, levee wall, to Jones & Laughlin Steel Corpn.; S. & W. Construction Co., Memphis, Tenn., general contractor.

**Ogden, Utah,** 292 tons, for Bureau of Reclamation, to Pacific Coast Steel Corpn.

**San Francisco,** 156 tons, for Naval Purchasing Officer, to Pacific Coast Steel Corpn.

#### NEW PROJECTS

**Sausalito, Cal.,** 400 tons, yacht harbor; bids to be taken in July.

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# Continuous Mill Planned For Homestead

PITTSBURGH, May 28.—The Carnegie Steel Co. will build a 90-in. continuous plate mill at its Homestead works, according to an unofficial report current here. Though this would be a very large mill, it would be exceeded in size by the existing 96-in. Gary mill. It is stated that the appropriation for the Homestead mill may be held up until the effect of the wiping out of NRA becomes clear.

# British Finished Steel Demand Is Brisk and Expanding

LONDON, May 27 (*By Cable*).—Pig iron output is being absorbed and stocks are virtually exhausted. Fresh business is steady but exports are small owing to unsatisfactory prices and exchange restrictions.

There is no new business in foreign semi-finished steel and English makers are busy. Finished steel demand is expanding. South Africa has ordered 10,000 tons of railroad material. Larger shipments are going to India and South America. Miscellaneous demand for construction steel is large. Good demand for special steel is anticipated in connection with air force expansion program. Dorman Long is spending £2,000,000 on works development including £500,000 on new coking plant.

Home and export business in tin plate is better and inquiry is brisk. Output is at over 50 per cent of capacity and unfilled orders exceed 2,500,000 boxes.

Continental iron and steel markets are dull and the cartel export program for the current quarter has been revised downward. Finished steel is particularly quiet, with a little business in semi-finished from Italy and Japan.

The recent London meeting of British steel makers and the cartel achieved nothing definite and a further meeting will be held in Luxemburg, June 4. Meanwhile, quotations have been suspended, and further business is unlikely until the position is clearer.

An agreement has been reached between Poland and the International Wire Rod Cartel. Poland is to quote cartel prices and adapt exports to the cartel program.

## Air Conditioning for African Mines

AIR conditioning has succeeded so well in one intolerably hot South African mine that another company has just ordered similar equipment, and the whole famous Rand district is expected to install refrigeration in order to keep on working the world's richest diggings, according to Thomas Midgley, vice-president, Ethyl Gasoline Corpn., in a report to the American Chemical Society.

Mr. Midgley, discoverer in the General Motors laboratories of refrigerants used in cooling mines, pointed out that the heat and humidity in the tunnels 1¼ to 1½ miles below the surface have become almost unbearable. Even South African natives can do less than a third of a day's work during a whole shift. Although the district has already produced wealth that dwarfs the riches of the Spanish Indies, Mr. Midgley said the greatest gold reserve known to engineers lies still deeper, where the reef is still hotter.

Faced with the possibility of being forced to abandon untold wealth, the mine owners are turning to American refrigerants to cool and dehumidify the tunnels.

The Union of South Africa has canceled tariffs on refrigerants to assist in the air-conditioning problem, thus opening up a free field for American products.

## British Subsidizing Cast Iron Research

THE British Cast Iron Research Association intends to take the fullest advantage of the Government's recent offer of financial aid. It is busy on a five-year plan under which it hopes to be enjoying by 1939 an annual income of $100,000. Of this total the British foundry trade will contribute $52,500, and of the remainder, $42,000 will be provided by the Government and $5,000 will be composed of other income from different sources.

The association now has a prospective income for the current year of only $65,000. Progress in the matter of membership nevertheless gives the association reasonable hope of achieving its aim. Since 1924 its industrial subscriptions have nearly trebled, and special effort is being made to accelerate this movement. Results achieved by the association's scientific investigators give the association a strong claim upon the very wide range of foundry and engineering trade, in whose interests it is steadily working. Apart from general technical inquiries into all aspects of foundry practice, the association attacks private problems submitted by member firms.

## Anti-Picketing Ordinance Passed

SEVERAL years ago Indianapolis passed an anti-picketing-boycott ordinance, which though contested, was sustained by the Indiana State Supreme Court. Its advantages are now recognized by Kokomo, Ind., which has adopted a similar ordinance, in part as follows:

Section I—Whoever shall watch, beset or picket the premises of another where any person is employed, or any approach thereto, or any place or approach thereto, where such employee lodges or resides, for the purposes of inducing any such employee, by compulsion, threats, coercion, intimidation, or by any act of violence, or putting such employee in fear, to quit his or her employment or to refrain from seeking or freely entering into employment, shall, upon conviction thereof, be fined in any sum not less than ten dollars ($10.00) nor more than three hundred dollars ($300.00) to which may be added imprisonment not exceeding sixty (60) days.

**British Prices, f.o.b. United Kingdom Ports**

*Per Gross Ton*

| | |
|---|---|
| Ferromanganese, export | £9 |
| Billets, open-hearth | £5 10s. to £5 15s. |
| Tin plate, per base box | *18s. 2d. to 19s. |
| Steel bars, open-hearth | £7 17½s. |
| Beams, open-hearth | £7 7½s. |
| Channels, open-hearth | £7 12½s. |
| Angles, open-hearth | £7 7½s. |
| Black sheets, No. 24 gage | £9 5s. |
| Galvanized sheets, No. 24 gage | £11 5s. |

*To June 1; 18s. 5d. to 19s. 3d. thereafter.

**Official Continental Prices, f.o.b. Continental Ports**

*Per Metric Ton, Gold £*

Current dollar equivalent is ascertained by multiplying gold pound price by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange.

| | |
|---|---|
| Billets, Thomas. | £2 7s. |
| Wire rods, No. 5 B.W.G. | £4 10s. |
| Steel bars, merchant | £3 5s. |
| Sheet bars | £2 8s. |
| Plate, ¼ in. and up | £4 |
| Plate, 3/16 in. and 5 mm. | £4 2s. 6d. |
| Sheets, ¼ in. | £4 7s. 6d. |
| Beams, Thomas. | £3 2s. 6d. |
| Angles (Basic) | £3 2s. 6d. |
| Hoops and strip base | £4 2s. 6d. |
| Wire, plain, No. 8 | £5 7s. 6d. |
| Wire nails | £5 15s. |
| Wire, barbed, 4 pt. No. 10 B.W.G. | £8 15s. |

# Replacement of Obsolete Equipment in Steel Mills

(CONTINUED FROM PAGE 47)

tion. A factor which must not be overlooked, however, is that labor should be given as regular employment as possible.

The general trend of the consumption of iron and steel products has been upward for many years. The consumption of a particular steel product will always show a very rapid rise shortly after the time of its introduction, followed by a period of leveling off and occasionally followed by a period of declining consumption. This is shown in the production of steel rails which reached its peak in 1906 and has been falling off ever since. On the other hand, the production of sheets and strips is increasing. This illustrates the point that the long-term load factor "K" of a finishing unit will always be lower than that of the primary departments such as the blast furnace and open-hearth or than the service departments which include transportation, electric power, steam and water departments. As the demand for one finished product decreases another may increase to such an extent that the demand on the open-hearth for steel ingots may be the same, and the demand on the service departments even greater because of the more highly finished nature of the product.

For instance, the energy required for rolling and finishing one ton of a light product like thin sheets is much more than that required for such products as heavy structural shapes, plates, or rails.

### Factors "AD" and "AO"

The second and third, or subtractive parts of the equation, also must be very carefully studied. The item "A," which not only enters into the subtractive portion but is also the divisor when determining the percentage of annual profit, varies from time to time. During a period of high construction costs, certain improvements will not be profitable, but with a material decrease in the cost of the various items which enter into a construction program, the same improvement might become profitable.

The item "AD," which is depreciation, may be calculated from the probable life of the machine or equipment in question, and, in general, the depreciation factor should be sufficient to set up a depreciation allowance equal to the cost of the unit less its scrap value at the time it becomes so worn that it is no longer efficient. This is a proper charge to include in operating cost, because it is merely a process of transferring a portion of the original cost of the equipment into its product which is sold. A careful engineering survey of the unit will ordinarily reveal a figure which will be proper to cover this wearing-out process. If conditions change, it may be necessary to either increase or decrease this figure so as to provide the proper depreciation reserve. Sufficient funds will then have been provided to prevent a loss when the unit has been worn out and must be retired.

The factor "AO" is not subject to the same mathematical calculations as "AD" because obsolescence is not a matter of wearing out, but rather a matter of earning capacity. This may be affected by the demand for the product of a unit decreasing because its cost is so great it cannot be sold or because the public no longer desires such a product, or for many other reasons, none of which, however, may be connected with the wearing out of the unit. Generally speaking, in the earliest stages of development of any new process, the obsolescence on equipment will be high because the operator of the equipment will invent improvements which will tend to lower the cost or improve the quality of the product to such an extent that the original equipment is no longer commercially usable. Therefore, in general, changes in equipment, where the processes are relatively new, should be delayed as long as possible in order to take advantage of the latest improvements, of course, never delaying such a change to the point where the losses are too great or where lack of quality in the product might result in loss of its market. Generally speaking, it is also true that during the early stages of development of a process the market demands are growing so that additional equipment of more modern design can frequently be added without scrapping the original equipment which can then be held for peak business operation only.

It should be noted that these two factors "AD" and "AO" are not to be added, but set up independent of each other; i.e., depreciation should be set to provide against wear and tear only and obsolescence should be set to provide against loss of service value. The latter is a matter of judgment and if it is the larger, the former does not count since the unit will be replaced before it wears out, assuming that the judgment of the management was correct in setting the obsolescence rate.

### The Factor "AM"

The remaining subtractive item in the equation "AM," the cost of capital with which to make improvements, is one which must be carefully surveyed and it may frequently happen that an improvement cannot be justified at one time due to the high cost of money and may be entirely feasible at some later time when the cost of money has decreased.

If there is a large cash surplus on hand, on which a very small return can be earned in the money markets, certain improvements may be made with much more certainty than if funds are scarce and must be borrowed. In general, there are few avenues of investment for surplus funds better than in needed improvements that stand the test of "Shall it be done?" "Shall it be done this way?" and "Should it be done now?"

In surveying this general problem, there are several rather obvious conclusions:

First: Improvements in service departments can be made on a lower net return than in manufacturing departments, because in general their load factor is higher and their obsolescence factor lower.

Second: Since the primary departments, i.e., blast furnace, open-hearth, bessemer and electric furnace have a higher load factor than the finishing departments, improve-

ments here can be made with better assurance that they will be used than is the case with the finishing departments.

Third: It becomes necessary to make improvements in certain finishing departments when they cannot meet competition of other producers or when they cannot meet the demands for quality from customers, whether the return on the investment is all that is desired or not. For this reason investments in finishing departments will always be a greater risk than in the primary and service departments.

Obsolescence to some extent can be postponed by improving component parts of equipment. For instance, the cylinders and pistons may be replaced with new ones of improved designs or the valve gear may be changed on existing gas or steam engines, materially improving their operation.

Supplementary roll stands may be added to existing mills or a steam engine may be replaced by electric motors as the main drive, control apparatus can frequently be applied to existing electric motors so as to improve their performance or increase the speed of the mill in order to increase production or improve quality by reducing the temperature drop between entering and finishing passes.

Equipment for controlling the rate of cooling of the finished product may be added to existing hotbeds in order to improve the quality of the finished product.

The art of welding has made possible changes to, as well as facilitating maintenance of, equipment which were formerly virtually impossible.

### Function of Patents

In the above discussion, processes and equipment have been considered without any regard to patents, but in many cases the patent situation cannot be ignored. For instance, the selling price of a product covered by a patent may be maintained at a relatively high figure. At the expiration of the patent, the selling price may possibly be materially reduced, and this reduction may expand the market to such an extent as to make this an even more attractive field. On the other hand, it may take away business from a competing product to such an extent that its production is no longer profitable and the equipment for its production obsolete.

It is also true that if a process or a piece of equipment is covered by a fundamental patent, obsolescence can be held within certain limits during the life of the patent and additional protection against obsolescence can frequently be obtained by application of improvement patents. However, it is dangerous economics to depend entirely upon patent protection for holding a market for any given commodity because the greater the potential profit in such a product, the greater will be the effort put forth by potential competitors to devise ways and means of avoiding the patents which cover it, and the greater the competition will be at the expiration of the patents.

In considering the subject of this discussion more concretely it might be well to replace some of the words in the title so that it reads: "The Profitable Application of New Ideas to the Steel Industry."

This application in some cases may involve a complete replacement of certain equipment or process, in others only a modification. The only purpose of this part of the discussion will be to suggest possibilities, rather than try to prove the case for any particular idea; such a proof would have to be predicated on many local factors such as the cost of coal delivered to the plant, what part of that cost was transportation, labor, losses, etc. This would set the value of a B.t.u. The market for by-products would also have to be known. The available labor would have to be studied: can it be trained to handle complex operations efficiently, or must such things be avoided?

In the transportation division a new tool is rapidly proving itself, the oil engine as applied to a locomotive. Such a locomotive has many advantages over the present-day steam locomotive for yard shifting as evidenced by the large number that were put into service last year as compared to the steam locomotive.

The use of roller bearings is rapidly proving its case against the conventional bearings, especially for cars which must carry heavy loads and where the break-away friction is an important item, or in places where heat thins out the grease or oil in the conventional bearing, or where excessive dirt necessitates frequent renewals of brasses. This is a typical case of where the improvement can be added to existing units.

In the steam department the modern steam generator is finding favor, not only because it is a very efficient unit, but also because it adapts itself very nicely to the job of burning the last remainder of by-product gas, supplemented automatically by powdered coal or oil.

The waste heat boiler as applied to gas engines, both for electric power generation and for blowing blast furnaces, has long been in use abroad and now has proven its case in this country, improving the thermal efficiency of the gas engine 30 per cent and being practically automatic in its operation. Except where the value of fuel is very low and where the load factor is less than 50 per cent, the return on the investment in these units will vary from 50 per cent to more than 100 per cent per year.

Closely allied to the steam department is power generation, not only because of the use of steam turbines, but also because the waste heat boiler referred to above makes it possible to generate power on gas engines somewhat cheaper than ever before, not forgetting that the design of gas engines has been materially improved by better ignition, more scientific lubrication, use of special valve rigging to insure the exhaustion of all the burned gases from the cylinders and supplying a full charge of fresh air to furnish the necessary oxygen for complete combustion.

It would now appear that an ideal electric generating station for a steel plant is a battery of gas engines of either 4000 or 8000 kw. capacity each, depending on the aggregate size of the station, equipped with waste heat boilers supplemented by some steam turbine capacity, to use the steam not only from the engine boilers, but also from the boiler plant which uses the last remainder of by-product gas.

The electrical department is finding it advantageous to replace many old and high cost motors with motors of more modern design equipped with anti-friction bearings, their windings enclosed in a dust-tight cover, but sometimes ventilated by means of a fan. Also modern automatic control for motors can give the producing oper-

ators what they need in the way of speed to reduce cost.

One of the principal improvements to the coke plants of the future will be simplification of design to reduce first cost. This new design will also include much better heat insulation and generally improved refractories.

Dry quenching of coke has very definite possibilities where the value of a B.t.u. is great or water is at a great premium.

The meeting place of the coke and ore is the blast furnace. Here the trend is to ever larger units.

The most attractive field for improvement of existing blast furnaces lies in the production and use of the gas. This may be accomplished by better stoves, the improvement taking the form of higher blast temperatures and lower fuel ratio, or a reduction in the gas burned in the stoves with a greater amount left for other purposes. The more efficient stoves require good gas cleaning and the modern electrical precipitation gas cleaners offer a saving in cost over the present-day mechanical cleaners sufficient to yield a net return on the investment in the order of 30 per cent to 50 per cent, and even up to 100 per cent where the cost of power and water is very high.

The modern gas engine-driven blowing engine, delivering blast at 18 lb. pressure, requires only 13.47 B.t.u. per cu. ft. of free air in the form of blast furnace gas and will also yield 0.003 lb. of steam from its accompanying waste heat boiler. With the value of gas at 13c. per million B.t.u., the net blowing cost of such a unit will be in the order of 25c. to 30c. per gross ton of pig iron in a 600-ton furnace, and less in a larger furnace.

## Open-Hearth Improvements

Recent improvements in open-hearth furnace design have been largely for the purpose of reducing the fuel required per ton of steel manufactured. Processes in the open-hearth furnace, of course, have been materially improved also, but these processes, generally speaking, can be applied to an old furnace almost as well as to a new one, provided the old furnace is capable of producing temperatures in the bath sufficient to cause the desired reactions. Improvements in the thermal design of the furnace, therefore, may be used either for the purpose of reducing the B.t.u.'s required per ton of steel, or to increase temperature in the bath in order to improve the quality of the steel manufactured.

Many of these improvements, in general, can be and have been applied to furnaces at the time of their normal rebuilding, except where space limitations do not permit sufficiently large regenerative chambers to be constructed. Under these conditions, and especially when new furnaces are being designed, it would appear that a portion of the regenerative chambers built entirely separate from the furnaces, as in the case of a blast furnace stove, might offer many advantages. The smaller furnaces in large open-hearth departments have become obsolete because the larger furnaces, in the order of 150 tons capacity, have shown considerably better operating costs.

Automatic control of the fuel applied to the furnace, by pyrometers suitably located in the roof, has permitted the roof to be insulated with a material increase in roof life over what was normal in the past, as well as a reduction of both fuel consumption and time required for making a heat. Improvements may be applied to a limited number of furnaces which can be operated at a high load factor, so that a greater yield on the improvement cost can be realized than if all were improved.

The present-day processes of making steel are rather contradictory, inasmuch as the metal is refined in the open-hearth, or even the electric furnace, until it is in as nearly a perfect condition as possible. It is then tapped into a ladle and teemed into ingot molds, where it is allowed to cool to solidification. In this process whatever impurities remain in the steel, together with certain alloys that have been purposely added, separate from the steel and concentrate in the center and near the top of the ingot, making it necessary to discard quite a percentage of the entire ingot to eliminate this undesirable part. It is a problem worthy of our best minds to devise a process whereby this segregation will not take place and we can take the ingot, or whatever its new name might be, and finish it complete for shipment to the customer.

The roughing or blooming mills usually supply blooms or bars of some form to a number of finishing mills and consequently work at a better load factor. Since there is usually a limited number in any plant, they must be reliable units, as the entire output of the open-hearth department must flow through these first mills. Improvements have largely been along the line of making these units more reliable or increasing their capacity. Application of the electric motor has improved the control that the operator has over the mill, making it possible to roll slow or fast. Also, where desired, automatic screw-down control can be arranged so that the draft per pass can be limited and a definite number of passes set up so as to insure each ingot being rolled similarly.

The general trend of the demands of the consumers of steel is for products that are more and more highly finished. Structural steel seems to be drifting toward sections of lighter weight but greater strength, and the finishing tolerances are becoming more and more restricted. This means closer rolling tolerances, and improvements in mills and mill operations must have this in view. Accurate temperature control will be necessary not only in the heating furnaces but also as the piece moves through the mill. The speed of the mills must be constant, so that each piece will finish in about the same time from the furnace.

Steel must be rolled to very accurate sizes, which requires finishing stands of great rigidity and finishing temperatures accurately controlled.

The heat treatment of steels to meet the requirements of the trade is calling for better furnaces and much more accurate control of temperature than ever before, as well as control of furnace atmosphere.

The steel industry takes its raw materials from the earth at the places where nature left them, assembles them at the mill, and, after several major metallurgical and mechanical operations, ships a rather highly finished product to its customers. These operations require a tremendous investment in mines, land, buildings and equipment at a rate of about $65 per ton of ingot producing capacity.

With 90 per cent activity it requires well over two years for the sales value of its products to equal

its invested capital. This means that in times of maximum volume of business, a 10 per cent profit included in the sales value represents a return of somewhat less than 5 per cent on the investment. No profit can be made at a low volume of business without a substantial increase in selling prices or a great reduction in operating costs.

This is a very different picture from that presented by industries which purchase their raw materials in a semi-finished state and convert them quickly into finished form for sale, and where a turnover of the capital investment can be made in one year, or from certain merchandising chain stores where the capital invested is turned over five or more times per year.

Money paid to workers in the steel industry represents 41 per cent of the sales value of its products.

Only 75 per cent of the ingot tonnage manufactured is shipped to the customer.

The cost of repairs and maintenance is about $8 per ton of product shipped, or $224,000,000 per year as an average over the past 10 years.

These figures offer a vivid explanation of why obsolescence is of such vital importance to the steel industry, and why each piece of equipment which proposes to reduce the man-hours per ton, increase the ratio of ingots poured to product shipped, or reduce the cost of maintenance, must be carefully as well as eagerly surveyed to determine its true economic value.


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## Discussion


By G. C. KIMBALL

*Vice-President, Illinois Steel Co., Chicago*


THE time available for studying Mr. Petty's paper has been inadequate to properly prepare such comments as the subject deserves. Looking back, however, over the past thirty-odd years in the steel industry, among the outstanding factors that come to one's mind are the marked changes that have taken place in steel products and in their methods of manufacture; for example, the notable increase in the proportion of open-hearth steel production and the development of steel produced in the electric furnace; the remarkable change in the tube business toward seamless products, and in the sheet business, particularly in later years, the advance in the production of hot-rolled products on continuous mills, and even still later the production of cold-reduced sheets. This is to mention only a few items which have required very large investments to replace obsolete equipment.

These changes in the character of the finished products just referred to also involve the suppliers of semi-finished steel, in that the more highly specialized the finished products are the more particular the finishing mills have to be with respect to their steel supply. The demand for high quality semi-finished steel not only involves the rolling mill but goes all the

way back to the quality and practice in the coke plant, the blast furnace and the open-hearth or electric furnace.

It is interesting to observe the caution referred to by Mr. Petty in considering the installation of new equipment. In the old days, extensions and improvements were largely made wherever the producing company had a large plant, regardless of the geographical location of the market. Today, before any improvement of consequence is made, it is the practice to make a market study to develop the probable demand and the most economical point of location for such facility, not only from the standpoint of manufacturing the product at a low cost, but particularly with respect to the final delivered cost.

On account of the extensive steel mill expansion extending over the past 25 or 30 years, a lesson has been brought home to us during the depression with respect to obsolescence. It was during this period of expansion that a concerted program developed toward heavy steel mill construction, involving buildings, cranes, mills, etc. All steel mill designs were of the most rugged type to withstand severe service; this involved unusually high construction costs and consequently heavy depreciation charges, a serious burden during the periods of low earnings. We find many plants, or at least parts of plants, standing today with many years of useful life remaining, so far as the facilities themselves are concerned, but dead as a door nail from the standpoint of commercial usefulness. This, of course, is due to the changes in consumer demands, making the product from such a plant noncompetitive, all of which involves large write-offs of capital investments. One lesson from this experience would seem to teach us to build for a more reasonable period of economic life, figuring to keep the investment moderate, requiring lower depreciation charges, and count on the equipment reaching the end of its life before it is overtaken by obsolescence.

Mr. Petty has referred to the fact that as sure as one venturesome soul makes a radical change in the size or otherwise improves a producing unit, all other such units which are not as efficient must be considered obsolete. It seems to me during periods of low operation and small financial returns in the steel industry that, perhaps, the plant equipped with smaller and more diversified mills, while not as efficient from a capacity standpoint, has certain advantages over a plant with larger and more specialized facilities. Specifications from customers during such times as these are smaller and much more diversified, and prompt shipments are necessary to obtain the business. The manufacturer with the smaller, less economic but more flexible equipment has a distinct advantage in meeting these trying conditions, and this type of equipment may not be as obsolete as it would appear from Mr. Petty's paper.

In his paper, Mr. Petty makes an observation with respect to depreciation, as follows: "Therefore, some average figure should be set up for the entire plant to provide a depreciation reserve, so that some units will be depreciated before they actually go out of service, while others will be taken out of service before they are depreciated to their scrap value, the remainder being charged to this reserve at once." Experience has shown that, in many cases, a composite or average rate of depreciation does not establish a sufficient reserve to provide for obsolescence, and it would seem to be quite important, under present conditions, to consider setting up depreciation on individual units making up a plant. While admittedly it is more difficult and involves additional expense in arriving at the depreciation charge, it certainly is more accurate and places the manufacturer in a much stronger position with the tax authorities in setting up losses due to obsolescence.

## Discussion

### By W. B. GILLIES

*Vice-President, Youngstown Sheet & Tube Co., Youngstown*

Mr. Petty has outlined four economic reasons for replacement. Unfortunately for a large number of us, the second reason, which is that a unit may be replaced because it is not producing a satisfactory product from the customer's point of view, and the third reason—a unit may be replaced because the cost of production of the unit is high, and therefore the profits, by virtue of its operation, are too low or have entirely disappeared—are the ones which have received our particular attention.

In the past few years, due to the rapid development in the art of manufacturing a number of steel products, and because of the insistence of our customers for better products, practically all the money available has been spent, not as we would like to spend it—promoting further economy, but in building units which would protect our position in the trade and furnish our customers with the size and quality of product they are now demanding.

Our own company has been forced to confine itself almost entirely to expenditures which go to the improvement in quality of our products, and we have had to forego many improvements.

Mr. Petty has developed an equation to obtain the percentage of profit from investment by the improvement of a unit. I would like to stress the importance of several of the items entering into this equation:

Take the item "K"—the percentage of time a new unit will operate over its life. It seems to me that in the past there has been a great tendency to overestimate the capacity of a unit, and that we should view this factor in the light of our recent experience and make very conservative estimates of what the operating time of a unit will be.

The item "D," representing the percentage of depreciation of a new unit, and the item "O"—percentage of obsolescence in the unit—both should be given careful consideration.

Item "A"—the total cost of the new unit—and item "M"—the cost of money in annual percentage—amount to so much money that fixed charges enter into the total manufacturing cost to such a great extent that they also must be given careful consideration.

I should like to suggest that an equation be developed using the same factors as in Mr. Petty's equation, and assuming a fair profit, which will give us the price at which a product should be sold.

It seems to be very difficult to obtain higher prices on the various standard steel products at this time, but with an answer such as the equation suggested would give we would have a fair figure below which we should not go in the sale of new products without putting ourselves in the same position as we are now with a number of our standard products. There is always a grave danger, due to the

apparent low manufacturing cost in some of the new steel products, of disregarding the items "K"—"AM" and "D" or "O."

Another factor which should receive careful consideration is—as Mr. Petty says—that with 90 per cent activity we would require approximately two years for the sales values of products in the steel industry to equal the invested capital. This means that in times of maximum volume of business a profit of 10 per cent incurred on the sales value represents a return of somewhat less than 5 per cent on the invested capital. This is a very different picture than presented by other industries which purchase their raw materials in a semi-finished form and convert them quickly into finished form for sale, and where a turnover of the capital investment can be made inside of a year, or from certain merchandising companies where the capital invested is turned over several times a year.

It would seem to me that these facts should be given very serious consideration, in order that we may resist the temptation to cut prices on some of our new products due to the apparent low manufacturing cost, below the return that is necessary to insure a fair profit when all factors are considered.

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## A Review of Code And Institute Activities

(CONTINUED FROM PAGE 32)

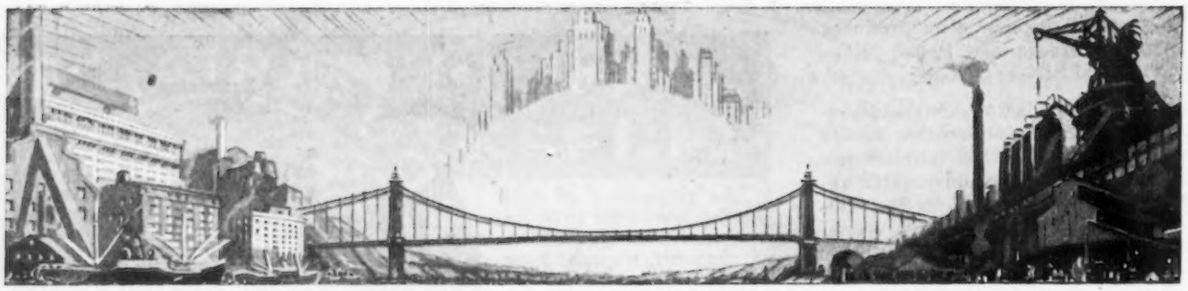
received from all sources during the last year exceeds 2000. The majority have already been investigated to the point where a definite opinion could be expressed by the enforcement division whether a violation of the code had occurred or whether the complaint was without basis in fact. More than half of all the investigations which have been completed have shown to the satisfaction of the enforcement division that the complaints were not justified.

In spite of the fact that a good many investigations have revealed violations of the code by members, or violations of their agreements by jobbers, the number is relatively insignificant when compared with the multitude of transactions or the volume of business carried on under the code. In such cases action by the board in accordance with the provisions of the code has assessed liquidated damages in the prescribed amounts against the concerns involved. At the same time it seems safe to say that in most of the cases where damages have been assessed, the violations were the result either of unintentional errors or misunderstanding of the provisions which were violated. It is also true, I think, that so far the enforcement division has not found, in any case where an investigation has been completed, that a violation of the code appears clearly to have been the result of deliberate or open disregard of code provisions on the part of any member.

A year of experience under the amended code indicates that it has been a remarkably effective instrument for eliminating unfair practices in the industry. It is, of course, doubtful if anyone would argue that the steel code, even now, is a flawless instrument. Even the Declaration of Independence does not explicitly set forth what it means by the assertion that all men "are created equal;" the Constitution of the United States is unsatisfactorily silent as to precisely how far the term "interstate" may apply; and the steel code does not specify what are "substantial quantities;" but in spite of such limitations the instrument in each case has proved effective for its purpose.

Much probably has been heard by some of you about the failure of the code to work in this case or in that respect. But probably less has been heard by any of you on that subject than has been heard by members of the staff of the institute who have been sitting during the past year at the focusing point of all the channels of gossip, allegation and rumor. When investigated and analyzed, however, the experience of the past year leads one to conclude that there has been far more complaining than cause; that in the hundreds of thousands of transactions handled by its members, the degree of compliance with code provisions has been remarkably high.

Any plan of human devising can succeed only in proportion to the desires of those who are party to it. If there be, therefore, among code members, complete good will to make it work, the task of administering the code will be comparatively simple. Its operation then will accomplish the full purpose which those who drafted it had in mind when the code was written.



# Plant Expansion and Equipment Buying

## Machine Tool Demand Adversely Affected by Strikes—June Outlook Improved

WITH the exception of continued activity in the automotive industry, the machine tool market has been rather quiet in the last week. Sporadic labor troubles in various parts of the country are partly responsible for lack of consumer interest, but with the situation in the automotive industry somewhat improved, a number of tools are being bought. Fisher Body Corpn. is reported to have inquiries out for equipment for its Pontiac, Mich., plant, and the Ford affiliate in France has bought a number of tools.

Generally speaking, the machine tool industry expects business to improve steadily until show time. Sales efforts up to and during the show will be very strenuous, and practically all builders have innovations and improvements which will add to the interest in their products.

### NORTH ATLANTIC

**American Can Co.,** 230 Park Avenue, New York, has leased building at Salisbury, Md., for new factory branch, storage and distributing plant. Company is also considering establishment of can-manufacturing plant in same locality.

**Board of Education,** Catskill, N. Y., plans manual training department in new multi-story high school. Cost about $300,000. Financing has been arranged through Federal aid. E. Sibley, Litchfield, Conn., is architect.

**Sinram Brothers, Inc.,** 415 East Thirty-seventh Street, New York, fuel oil and coal distributer, has filed plans for new bulk oil storage and distributing plant at Exterior and 138th Streets, Bronx, with bulk coal-handling, loading and distributing unit on adjoining site. Cost about $45,000 with equipment. Thomas Dunn, 375 Fordham Road, Bronx, is architect.

**Croft Steel Windows, Inc.,** New York, has been organized by Joseph C. Bancroft, 45-36 Thirty-ninth Place, Long Island City, and associates, to manufacture steel windows, doors and kindred steel specialties.

**Department of Plant and Structures,** Municipal Building, New York, has let general contract to William Kennedy Construction Co., 215 Montague Street, Brooklyn, for new municipal incinerator plant at Flushing, L. I., at $597,377.

**D. W. Hutchinson & Co., Inc.,** 45 Cliff Street, New York, manufacturer of essential oils has leased five-story building at 162-4 Front Street for new plant, including storage and distributing facilities. Present works will be removed to new location.

**Signal Supply Officer,** Army Base, Brooklyn, asks bids until June 4 for one light-testing machine for determining printing light values (Circular 141); until June 10, telegraph vibrating keys (Circular 137).

**Electric Machine Mfg. Co., Inc.,** New York, has been organized by Philip De Louise, 409 Pleasant Avenue, New York, and Matthew F. Streppone, 6222 Spencer Avenue, Bronx, to manufacture heavy electrical machinery and parts.

**Bureau of Supplies and Accounts,** Navy Department, Washington, asks bids until June 4 for 144 acetylene regulators and 312 oxygen regulators (Schedule 5195), four combined manually and electrically operated whistle valves and spare parts (Schedule 5159), for Brooklyn Navy Yard; until June 7, 13,500 lb. galvanized steel expanded metal (Schedule 5177), for Brooklyn and Mare Island yards; helical springs, open box springs, etc. (Schedule 5162), for Brooklyn, Sewall's Point and Mare Island yards.

**Carbide & Carbon Chemicals Corpn.,** 30 East Fortieth Street, New York, has approved plans for new steam power plant at South Charleston, W. Va., works, 95 x 100 ft. Cost over $275,000 with equipment.

**Diamond Sign Co.,** 532-A East Twenty-sixth Street, Brooklyn, manufacturer of signs and displays, has leased two-story building at 117-19 Ditmas Avenue for new plant.

**Commanding officer,** Watervliet Arsenal, Watervliet, N. Y., asks bids until June 5 for one deep-hole drilling and knee-assembly unit (Circular 79).

**Standard Motor Construction Co., Inc.,** 172 Whiton Street, Jersey City, N. J., manufacturer of gasoline marine engines, parts, etc., has acquired plant of Covington Machine Co., Covington, Va., for new branch works.

**Board of Education,** Penns Grove, N. J., plans manual training department in new two-story regional high school between Penns Grove and Upper Penns Neck Township, for which superstructure will begin at once. Cost $315,000. Dr. Paul W. Carleton is president of board.

**Ornamental Art Metal Works,** Jersey City, N. J., has been organized by Edwin J. Geils, Jersey City, and associates. New company will take over organization of same name with plant at 747 Grand Street.

**Supply Officer,** Naval Aircraft Factory, Navy Yard, Philadelphia, asks bids until June 4 for drop forged steel clamps (Req. 5015-1860 S. & A.), 10,000 copper-asbestos engine gaskets (Req. 502-1690 Aero).

**Philadelphia & Reading Coal & Iron Co.,** Reading Terminal, Philadelphia, plans rebuilding part of machine, forge and carpenter shops at coal properties at West Shenandoah, Pa., recently damaged by fire. Cost over $50,000 with equipment.

**Bureau of Supplies and Accounts,** Navy Department, Washington, asks bids until June 4 for three air compressors and spare parts (Schedule 5134), one band saw machine 5193), two grinders (Schedules 5206 and 5205), one milling machine (Schedule 5208), one hydraulic drive table surface grinder (Schedule 5215), one milling machine, all motor-driven (Schedules 5209, 5210, 5211 and 5212 respectively each for one unit), six pneumatic grinders (Schedule 5199), 400 oxygen cylinders, complete with valves, etc. (Schedule 5246), two powered powder swaging presses and 10,000 cartridges (Schedule 5175) for Philadelphia Navy Yard.

**Everware Nickel Plating Chromium Co., Inc.,** formerly at 864 Bedford Avenue, Brooklyn, has moved to 109-113 South Fifth Street, occupying 10,000 sq. ft. of floor space. Company does all kinds of electro-plating. B. H. Berowitz is president and treasurer, and J. Turshen, secretary.

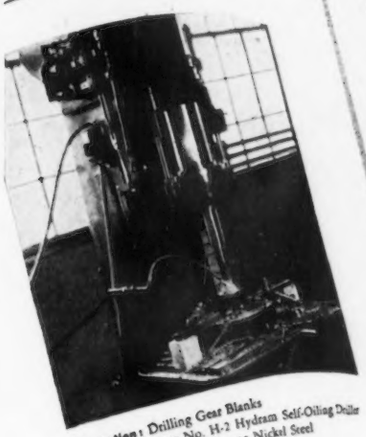
### NEW ENGLAND

**Dewey & Almy Chemical Co.,** 235 Harvey Street, Cambridge, Mass., manufacturer of industrial chemicals, etc., has let general contract to Frankini Construction Co., Medford, Mass., for two-story addition, 50 x 130 ft. Cost over $45,000 with equipment.

**Cambridge Machine & Tool, Inc.,** Cambridge, Mass., has been organized by Hurant H. Seron, 117 Webster Avenue, and associates, to manufacture mechanical equipment, parts, etc.

**United States Engineer Headquarters,** Washington, Major Philip B. Fleming, chief of Army Engineers, will soon begin surveys for Quoddy project at Passamaquoddy Bay, Eastport, Me., comprising power dams for hydroelectric power development. Initial power plant will have capacity of 166,670 kva., to be increased to 366,674 kva. later. A large navigation lock will be built, with set of emptying gates. An initial appropriation of $10,000,000 has been granted by PWA, to be increased to $36,000,000. Work is scheduled for completion in about three and one-half years.

# For Fast, Clean DRILLING



**Operation:** Drilling Gear Blanks
**Machine:** Barnes No. H-2 Hydram Self-Oiling Driller
**Material:** SAE 3140 Chrome Nickel Steel
**Size of Drill:** 2½ inches
**Lubricant:** 1 part Sunoco to 20 parts water

*Courtesy of*
**Barnes Drill Company**
*Rockford, Ill.*

**Operation:** Resharpen cutting lips of 1 in. diameter twist drills.
**Machine:** Sellers No. 2B Drill Grinder
**Material:** High Speed Steel
**Stock Removed:** ⅛ inch off each lip
**Wheel:** 8 in. x 2½ in. x 1¼ in. face. Special shape.
**Coolant:** 1 part Sunoco to 40 parts water.

*Courtesy of*
**William Sellers & Co., Inc.**
*Philadelphia, Pa.*

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Observations of drilling operations in many shops over long periods of time indicate unmistakably other advantages which follow the use of Sunoco. Drills clean easily; chips don't freeze on the drill; there's no clogging; no burning. Longer drill life is noted — and power costs are lowered. These are not generalizations; they are actual results widely achieved by Sunoco.

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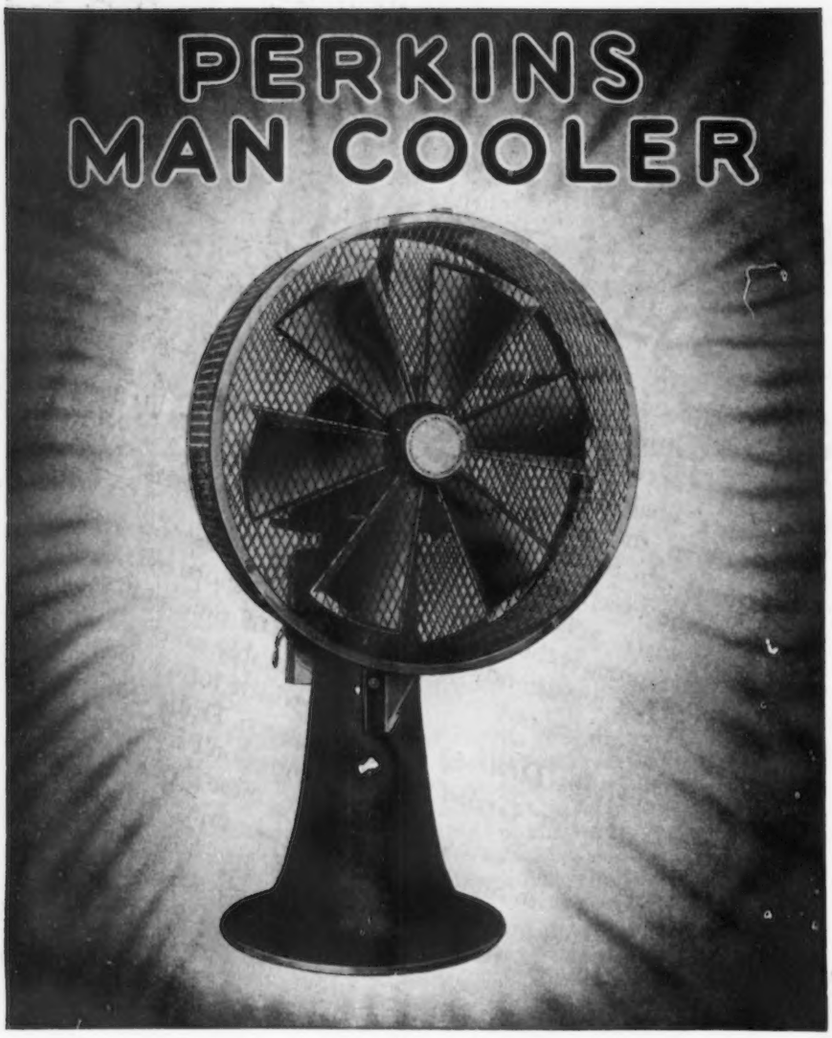


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Readily moved from place to place, they bring comfort to men working in hot places, resulting in decreased labor turnover, increased production and fewer accidents.

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*ENGINEERS AND MANUFACTURERS*


**Gould Oil Burner Corpn.**, Cambridge, Mass., has been organized by Joseph E. Gould and William H. Keohane, 10 Pine Street, Wellesley, Mass., to manufacture oil burners and oil-burning equipment.

**Hathaway-Braley Wharf Co.**, New Bedford, Mass., has started work on a two-story machine shop, 60 x 125 ft., at Fairhaven, Mass. John F. Tinkham, superintendent, is supervising work.

## OHIO AND INDIANA

**Johnson Steel & Wire Co.**, Bailey Road, Cuyahoga Falls, Ohio, with main plant at Worcester, Mass., has plans for one-story addition, to cost about $35,000 with equipment. J. H. Paterson is general manager at Cuyahoga Falls. Company has also awarded general contract to Fred Clemmer Co., 576 Merriman Road, Akron, Ohio, for new one-story plant at Akron, 60 x 275 ft. Cost over $65,000 with machinery.

**Brass Products Mfg. Co.**, Cleveland, has been organized by A. H. Ganger and Gilbert H. Wieder, 332 East Ohio Gas Building, to manufacture brass goods.

**Triplett Electrical Instrument Co.**, Bluffton, Ohio, manufacturer of electrical instruments and equipment, plans one-story addition, totaling about 15,000 sq. ft. floor space.

**Material Division, Air Corps**, Wright Field, Dayton, Ohio, asks bids until June 3 for one 50-kw. motor-generator set and one 10-kw. similar set (Circular 758), one 10-cu. ft. concrete mixer (Circular 761); until June 4, 20 solenoid assembly bomb racks (Circular 749), four sets filter units (Circular 756); until June 5, 400 vacuum pump assemblies (Circular 750).

**Board of Sanitary Commissioners**, City Hall, Indianapolis, asks bids until June 6 for one 4000 gal. per min. motor-driven centrifugal pumping unit, digesters and other equipment for sewage disposal works. Henry B. Steeg is city engineer.

**Allied Truck Equipment Corpn.**, Indianapolis, manufacturer of all-steel safety school buses and kindred motor truck equipment, occupying space in former Plant No. 2, Marmon Motor Co., has leased about 14,000 sq. ft. additional space in same building for expansion, doubling present facilities.

## WESTERN PA. DIST.

**Corbett Cabinet Mfg. Co.**, St. Marys, Pa., has plans for one-story addition, 33 x 55 ft. Cost about $25,000 with equipment.

**City Council**, New Castle, Pa., is considering a special election to vote bonds for new municipal electric light and power plant. Cost over $500,000 with distributing lines.

**Borough Council**, Smithfield, Pa., plans installation of pumping machinery and auxiliary equipment, pipe lines, etc., in connection with new water system. Fund of $45,000 has been secured through Federal aid.

## SOUTH ATLANTIC

**Public Works Commission**, Fayetteville, N. C., asks bids until June 5 for extensions and improvements in municipal electrical distributing system, including new equipment. William C. Olsen, Raleigh, N. C., is consulting engineer.

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until June 7 for bronze and steel cable for Pensacola, Fla., San Diego and Sewall's Point navy yards (Schedule 5154), one concrete mixer for Pensacola yard (Schedule 5224).

**City Commission**, Clearwater, Fla., plans establishment of a municipal incinerator plant, with furnace unit and other mechanical equipment. A. C. Nichols is city manager, in charge.

**Swift & Co.**, Union Stock Yards, Chicago, have low bid from S. S. Jacobs, Hildebrandt Building, Jacksonville, Fla., for new two-story and basement branch plant at Augusta, Ga. Entire project will cost about $85,000 with equipment.

## SOUTHWEST

**Board of Education**, Tulsa, Okla., plans manual training department in new three-story and basement junior high school in East Side district. Cost about $1,000,000. Leon Senter, Philtower Building, and Joseph R. Koberling, 569 South Peoria Street, are associate architects.

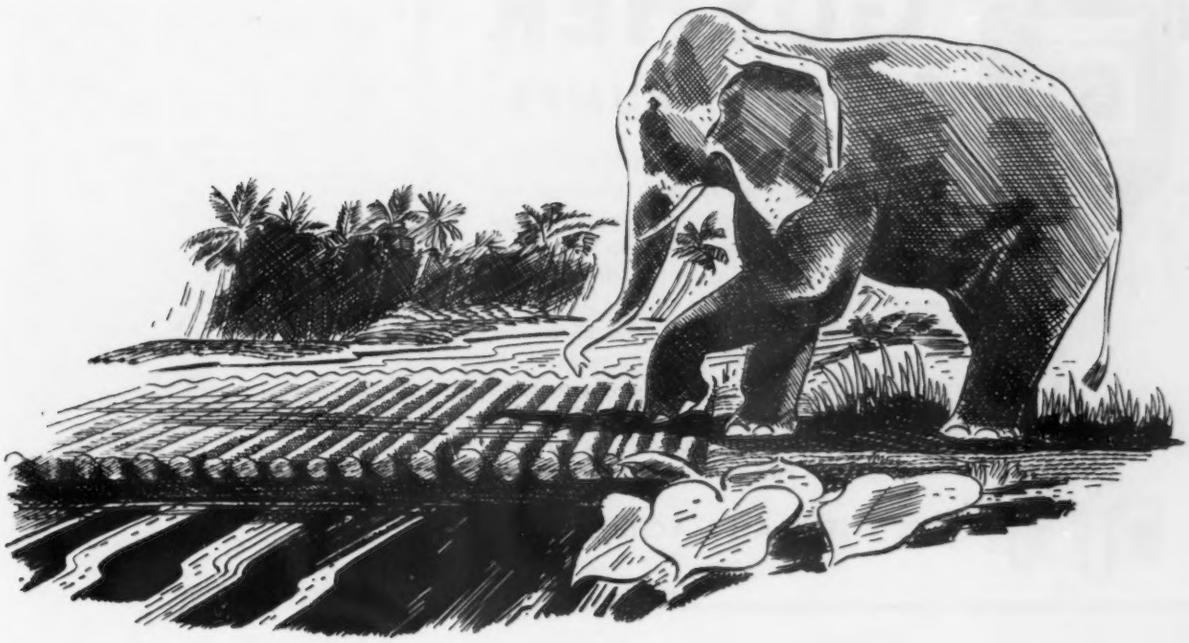
**Board of Works**, Fort Smith, Ark., asks bids until June 17 for new water system, including filter plant machinery, chemical feed and mechanical mixing equipment, hydraulic turbo-generator set and oil engine-generator set, with accessories, pipe lines, etc. Project will cost about $1,500,000. W. R. Holway, 302 East Eighteenth Street, Tulsa, Okla., is consulting engineer.

**City Council**, Burlington, Kan., will soon take bids for new municipal electric light and power plant, using Diesel engine-generating units. Cost about $145,000 with equipment. E. T. Archer & Co., New England Building, Kansas City, Mo., is consulting engineer.

**Construction Service**, Veterans Administration, Arlington Building, Washington, plans new equipment and distribution warehouse and utility building at Excelsior Springs, Mo. Cost about $50,000. A new electrical distribution system is planned at Jefferson Barracks, Mo., to cost over $100,000.

**Cortez Oil Co.**, Trinity Life Building, Fort Worth, Tex., B. F. Weekely, president, plans new bulk oil storage and dis-

# THE ELEPHANT HAS A SOUND IDEA . . .



He tests a bridge before he'll risk it with his full weight. IRM, too, likes to be sure of its footing before walking into a new situation; properties must meet our standards before we insure them, and we like to have the prospective policy holder "test the bridge" with equal care.

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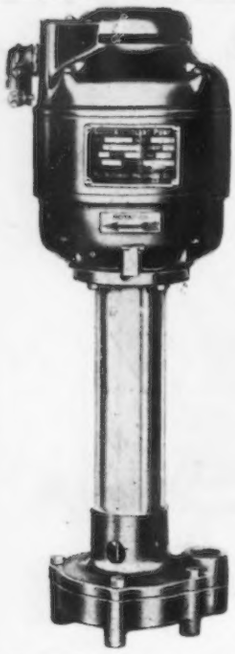
Lumbermen's Mutual Insurance Co., Mansfield, Ohio
Michigan Millers Mutual Fire Insurance Co., Lansing, Mich.
Mill Owners Mutual Fire Insurance Co. of Iowa, Des Moines, Iowa
Millers Mutual Fire Insurance Assoc. of Illinois, Alton, Ill.
Millers Mutual Fire Insurance Co., Fort Worth, Texas
Millers Mutual Fire Insurance Co., Harrisburg, Pa.
National Retailers Mutual Insurance Co., Chicago, Ill.
Northwestern Mutual Fire Assoc., Seattle, Wash.
Pennsylvania Lumbermen's Mutual Fire Insurance Co., Phila., Pa.
Pennsylvania Millers Mutual Fire Insurance Co., Wilkes-Barre, Pa.
United Mutual Fire Insurance Co., Boston, Mass.
Western Millers Mutual Fire Insurance Co., Kansas City, Mo.



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THE RUTHMAN MACHINERY CO.
Cincinnati, Ohio


tribution plant in Samfordyce oil field, Hidalgo County, Tex., in connection with new pipe line in same district. Entire project will cost about $500,000.

**Commanding Officer,** San Antonio Arsenal, San Antonio, Tex., asks bids until June 6 for one test bench for servicing high-speed heavy-duty type generators, etc., and for one coil and condenser tester with stand (Circular 14).

**Board of Education,** St. Louis, asks bids until June 5 for four 165 hp. water tube boilers and two 150 hp. fire tube boilers.

## BUFFALO DISTRICT

**American Radiator Co.,** 1803 Elmwood Avenue, Buffalo, plans remodeling Pierce radiator manufacturing works, 1741 Elmwood Avenue, and installation of additional equipment. Plant has been closed for about three years. D. H. Locke, vice-president, will be in charge.

**Binghamton Gas & Electric Co.,** Binghamton, N. Y., has plans for one-story and basement addition to service and mechanical works, 50 x 165 ft. Cost close to $45,000 with equipment. Conrad & Cummings, 99 Collier Street, are architects.

**Jamestown Iron Works, Inc.,** Jamestown, N. Y., has been organized by Thomas F. Maher, 722 West Fifth Street, and Edwin P. Maher, 411 Murray Avenue, to manufacture iron and steel specialties and operate a general iron works.

## WASHINGTON DIST.

**Quartermaster, Third Corps Area,** Post Office Building, Baltimore, asks bids until June 4 for portable buildings (Circular 41).

**Pittsylvania Lumber & Mfg. Co.,** Chatham, Va., plans purchase of planer, band resaw, bench tools, etc., to replace machinery recently destroyed by fire. Equipment will also be installed for steam power house.

**General Purchasing Officer,** Panama Canal, Washington, asks bids until June 3 for adjustable pipe wrenches, bolt dies, blacksmiths' chisels, clamps, strap hinges, coil chain, chain links, assorted files, pipe dies, four distribution-type transformers, voltmeters and other equipment (Schedule 3059).

**Board of District Commissioners,** District Building, Washington, asks bids until June 7 for iron castings, patterns, gages, etc., for lamp posts for Electrical Division.

**Big Vein Coal Co.,** McCoy, Va., plans new power plant at mining properties, and will also install coal-handling and loading equipment. Cost about $35,000.

**Quartermaster,** Bolling Field, D. C., asks bids until June 4 for one 5-ton three-wheel gasoline motor-driven road roller (Circular 10).

**Cecil County School Board,** Elkton, Md., plans manual training department in new multi-story high school. Cost over $200,000. E. William Martin and Ralph A. Jeffers, duPont Building, Wilmington, Del., are architects.

**Bureau of Supplies and Accounts,** Navy Department, Washington, asks bids until June 4 for 25 electric drills for Yorktown, Va., station (Schedule 5202), one motor-driven horizontal boring, drilling and milling machine and spare parts for Portsmouth Navy Yard (Schedule 5191).

## MIDDLE WEST

**Liquid Carbonic Co.,** 3100 South Kedzie Avenue, Chicago, manufacturer of carbonating and bottling machinery, parts, etc., has plans for one-story addition, 100 x 600 ft. Cost over $150,000 with equipment. Joseph J. Novy, 2434 South Ridgeway Street, is architect.

**Wilson & Co., Inc.,** 4100 South Ashland Avenue, Chicago, meat packer, has taken out permit for one and three-story addition, 24 x 800 ft. Cost over $200,000 with equipment. C. P. Barnett, address noted, is company architect.

**City Council,** Hutchinson, Minn., has engaged Buell & Winter Engineering Co., Insurance Exchange Building, Sioux City, Iowa, consulting engineer, to prepare plans for new municipal electric light and power plant. Fund of $250,000 has been authorized.

**United States Engineer Office,** Fort Peck, Mont., asks bids until June 4 for one 20,000-lb. hand-operated traveling crane and trolley hoist (Circular 246); until June 5, rubber insulated single-conductor welding lead cable (Circular 248); until June 6, four industrial gas unit heaters, with motor and controls, and two thermostats (Circular 249).

**Construction Service,** Veterans Administration, Arlington Building, Washington, plans new electrical distribution system at Ford Harrison, Mont. Appropriation of $45,000 is being arranged.

**Concrete Materials Co.,** 230 East Eighth Street, Sioux Falls, S. D., plans one-story addition for storage and segregating of products, including bin units, each about one carload capacity, with conveying, loading and other mechanical-handling equipment. Cost over $25,000 with equipment.

**Adams Iron & Wire Works, Inc.,** 3803 Cottage Grove Avenue, Chicago, has been organized by John Laube and John Edwards, to manufacture wire goods and kindred metal specialties.

**Common Council,** Spring Valley, Minn., will soon take bids for new municipal electric light and power plant, using Diesel engine-generator units and electrical distribution system. Cost about $110,000. Fund in that amount has been arranged. G. M. Orr & Co., Baker Building, Minneapolis, are consulting engineers.

**J. E. Gilson Co.,** Port Washington, Wis., specializing in manufacture of fine, light gray iron castings, has placed general contract with T. E. Gahan Co., local, for foundry extension, 60 x 100 ft., and is buying considerable new equipment.

**International Harvester Co.,** Chicago, has purchased property at Green Bay, Wis., adjoining present branch plant, and will build addition, 86 x 150 ft., for motor truck division. Cost about $175,000. George M. Ahlschwede is branch manager.

**Calumet County Board,** Chilton, Wis., has appropriated $33,000 for erection and equipment of new County highway department garage, warehouse and machine shop, 70 x 200 ft., part two stories, designed by W. C. Weeks, architect, 720 Ontario Avenue, Sheboygan, Wis. Bids will be taken after June 1. Ray Jensen is County highway commissioner.

**Green County Board,** Monroe, Wis., contemplates erection of new County highway department building, 100 ft. sq., to cost $50,000 complete. Herman W. Kohn is County highway commissioner.

**Wisconsin Steam Corpn.,** 335 McKinley Avenue, Eau Claire, Wis., has been granted authority to build a central heating plant and distributing system. Cost about $200,000.

## MICHIGAN DISTRICT

**Chrysler Corpn.,** 341 Massachusetts Avenue, Detroit, has asked bids on general contract for addition to engineering building at 12800 Oakland Avenue. Cost over $50,000 with equipment. Albert Kahn, Inc., New Center Building, is architect and engineer.

**Michigan Sugar Refining Co.,** Second National Bank Building, Saginaw, Mich., plans extensions and improvements in beet sugar refinery at Owosso, Mich., including modernization of production facilities. Cost close to $45,000 with equipment.

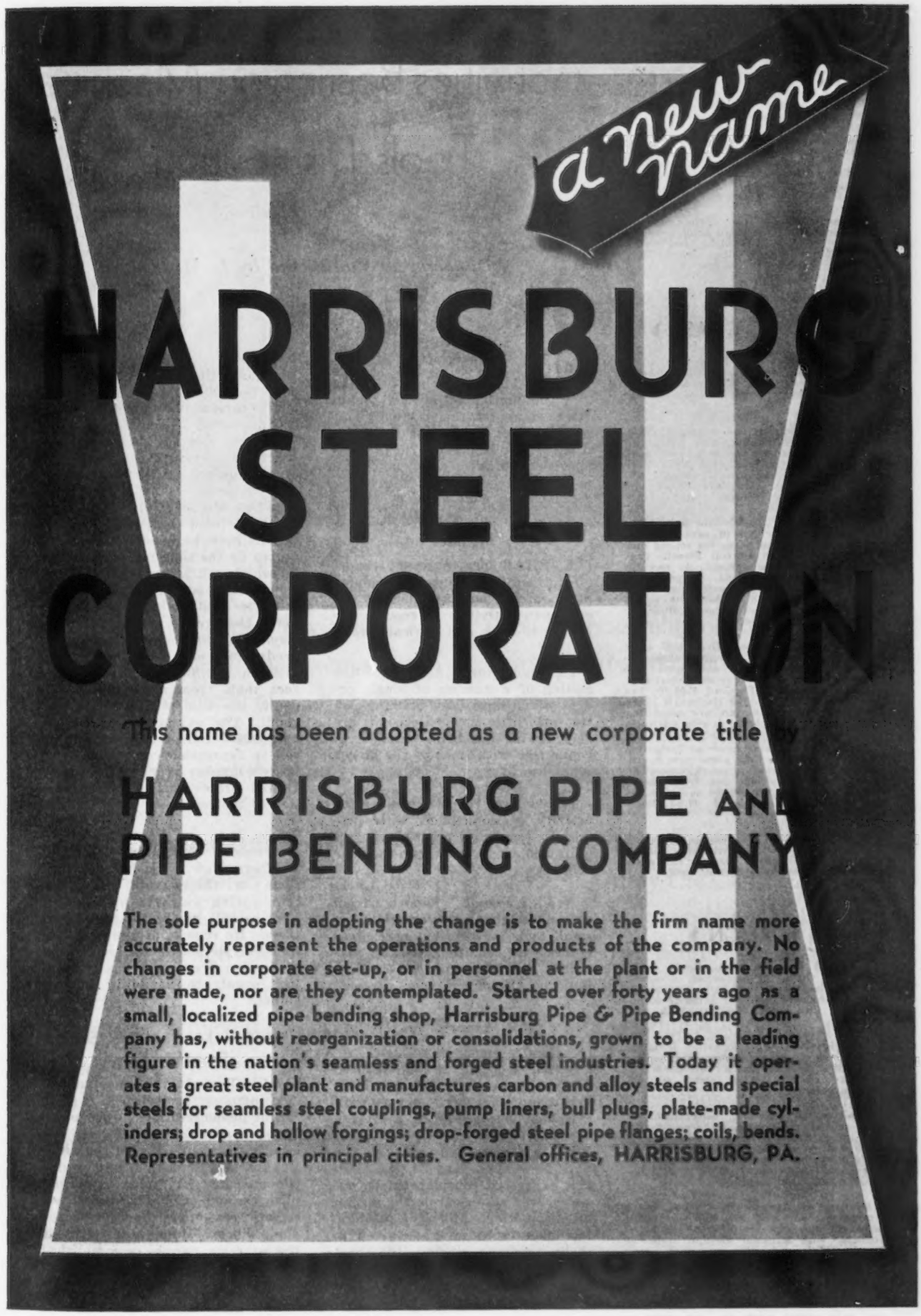
**Wayne Products & Brewing Co.,** 3603 East Hancock Street, Detroit, plans one-story top addition for storage and distribution, to include installation of tanks and other equipment.

**Sal-Way Heat Treating Co.,** 624 West Elizabeth Avenue, Detroit, has been organized by Theodore G. Trocke, 18455 Lenore Avenue, and associates, to operate a metal processing and heat-treating plant.

## SOUTH CENTRAL

**Great Southern Wirebound Box Co.,** Southport, New Orleans, has let general contract to Lionel F. Favret, 937 Gravier Street, for one-story addition, 100 x 400 ft., to be used in part for production of corrugated fiberboard containers, wirebound units, etc. Cost over $100,000 with machinery.

**Director of Purchases,** Tennessee Valley Authority, Knoxville, Tenn., asks bids until June 7 for 60 40 ft. x 15 ft. radial gates, complete with bearings, pins, wall plates and accessories, and for two 47½ ft. x 6


a new name
HARRISBURG STEEL CORPORATION
This name has been adopted as a new corporate title by
HARRISBURG PIPE AND PIPE BENDING COMPANY
The sole purpose in adopting the change is to make the firm name more accurately represent the operations and products of the company. No changes in corporate set-up, or in personnel at the plant or in the field were made, nor are they contemplated. Started over forty years ago as a small, localized pipe bending shop, Harrisburg Pipe & Pipe Bending Company has, without reorganization or consolidations, grown to be a leading figure in the nation's seamless and forged steel industries. Today it operates a great steel plant and manufactures carbon and alloy steels and special steels for seamless steel couplings, pump liners, bull plugs, plate-made cylinders; drop and hollow forgings; drop-forged steel pipe flanges; coils, bends. Representatives in principal cities. General offices, HARRISBURG, PA.

ft. trashway gates, complete with seals and accessories, for Wheeler Dam.

**Dowling Brothers Distilling Co.**, Burgin, Ky., has plans for still house and other units, and will begin superstructure soon. Cost over $80,000 with equipment. Carl J. Kiefer, Schmidt Building, Cincinnati, is consulting engineer.

**Board of Trustees**, Alabama Polytechnic Institute, Auburn, Ala., plans new one-story aeronautical engineering building, including engine repair and testing shops and other mechanical departments. Cost about $200,000 with equipment.

**Common Council**, Dyer, Tenn., has secured authority to arrange bond issue for new municipal electric light and power plant, and will have plans drawn soon. Cost over $80,000 with equipment.

## PACIFIC COAST

**Hancock Oil Co.**, Long Beach, Cal., plans new bulk oil storage and distributing plant at Stockton, Cal. Cost about $40,000 with steel tanks, pumping station and other equipment.

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until June 4 for one motor-driven tool room precision lathe for San Diego Navy Yard (Schedule 5178); until June 7, about 12,000 steel boiler tubes for Mare Island and Puget Sound yards (Schedule 5152).

**Pacific Can Co.**, 290 Division Street, San Francisco, manufacturer of cans and containers, has approved plans for second unit at plant on North Carroll Street. Cost about $30,000 with equipment. As recently reported in these columns, company has plans also for one-story extension, 111 x 250 ft. Cost close to $70,000 with equipment. Ellison & Russell, Pacific Building, are consulting engineers.

**City Council**, Medford, Ore., will close bids about June 12 for pumping machinery and accessories, sludge equipment and other power machinery for municipal sewage disposal works. Fund of $100,000 has been arranged. Greeley & Hansen, 6 North Michigan Avenue, Chicago, are consulting engineers; F. W. Scheffel is city engineer.

**Board of Directors**, Imperial Irrigation District, El Centro, Cal., plans new hydroelectric generating plant on All-American Canal, with substations and transmission system. Fund of $13,500,000 is being arranged through Federal aid. M. J. Dowd is chief engineer.

**Superintendent of Lighthouses**, Sixteenth Lighthouse District, Ketchikan, Alaska, asks bids until June 3 for two full automatic Diesel engine-generator sets.

## FOREIGN

**Cobalti & Derivati, S. A.**, Genoa, Italy, plans new works for production of cobalt, cobalt salts, acids and allied products, with by-products plant for sulphide manufacture. Cost over $500,000 with machinery.

**Cadbury Co., Ltd.**, Bournville, Birmingham, England, manufacturer of chocolate and allied food products, has plans for six-story addition. Cost about $600,000 with machinery.

**Ministry of Industry**, Government of Turkey, Ankara, Turkey, plans new textile mill near Naiseli, Turkey, where large tract has been selected. Plant will include power house, machine shop and other mechanical departments. Cost about $1,200,000 with equipment.

**Ministry of Agriculture**, Buenos Aires, Argentina, will soon ask bids for chain of grain elevators in different parts of country, with terminal elevator units at Buenos Aires and other principal cities. Plants will have gross capacity of 10,000,000 tons, with equipment for screening, elevating, conveying, etc.

# Activities Bearing on Machine Tools Distribution

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***A Department Conducted by L. M. Waite***

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### Deliveries

ATTENTION is being called to the matter of delayed deliveries on an increasing number of machine tool lines. The fact that it no longer is possible to pick up skilled shop men at a moment's notice is given as the prevailing cause over a wide area.

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### Inquiries

SEVERAL dealer areas report not only a maintained volume of inquiries but a sufficient increase in activities to require additions to sales and clerical forces.

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*Pittsburgh area* advises of the closing of a number of single orders which have been hanging fire for some little time. Decisions are reported as not being reached in connection with some of the larger inquiries.

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*Detroit area* reports considerable activity in connection with proposals covering prospective requirements for later-in-the-year schedules.

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*New England.* Reports from several companies specializing in small tools indicate an increasingly bettered condition, with probabilities that May will lead the first four months of the year.

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### Exports

IN this column, May 9, we reported a visit to the United States by general director Mehlich and factory manager Schröder, executives of a Berlin, Germany, gear-making plant. Prior to their return-sailing on the S. S. New York, May 22, Mr. Mehlich expressed considerable enthusiasm over results from the design attention which American machine tool manufacturers have given to their products during the past three years. The hurried machinery investigation trip took these gentlemen to Cincinnati, Chicago, Rockford, Ill., Detroit, Cleveland, Syracuse, N. Y., Hartford, Conn., and to several plants in the Metropolitan area. Upset monetary conditions and existing trade restrictions prevented the placing of orders for some $50,000 worth of new equipment which was investigated on the trip. However, Mr. Mehlich stated that, after conversations here, he hopes to work out a plan by the time he reaches Berlin which will be approved by governmental authorities in both countries and make it possible to place the orders in the near future. In discussing Continental needs for new equipment, Mr. Mehlich significantly stressed the fact that, from a buying standpoint, his company is relatively small. The extent by which the automotive industry is serving to relieve depression conditions in so large a number of industries in the United States was a prime reaction to the trip.

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Theodore Marburg, Marburg Brothers, New York, has returned from a three-month European trip, during which he investigated Continental machine tool conditions. He reports a number of interesting developments along lines of foreign design changes pertaining largely to flexibility in machines.

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### Modern Machine Tool Stunt Demonstrations

WHAT we in the machine tool industry sometimes term "stunt demonstrations" very often have a psychological effect in the creating of confidence in the abilities of any machine tool which demonstrates its fitness to accomplish the extreme. The almost automatic reason can be analyzed as along lines of impression that—if the extreme can be accomplished with reasonable ease, anything less than the extreme subjects

A continuously up-grade sales curve, even through these past few years . . . a reflection of unusual management and production achievement . . . has marked the household appliance industry. One million two hundred thousand washing machines alone were sold in 1934.

And a substantial contribution to this success can be credited to an intelligent, generous use of ZINC Alloy Die Castings. Greater strength per unit of weight and immeasurable improvement in appearance were achieved by the design engineers through their use of die castings. Radical reductions in machining and assembling costs were achieved by the production engineers.

ZINC Alloy Die Castings effect these same savings in many other industries. The possibility of combining several parts hitherto designed for screw machine parts and stampings joined by screws, rivets, or welds into a single rigid die casting has been an important factor in the redesign of many products . . . redesign for stronger, more compact parts . . . redesign for ZINC Alloy Die Castings.

We will gladly send you the latest information on the achievements of ZINC Alloy Die Castings . . . the properties of ZINC Die Casting Alloys . . . the simple methods of finishing them with metal or lacquer finishes. For this information, without obligation, write: THE NEW JERSEY ZINC COMPANY 160 Front Street, New York City

HORSE HEAD ( 99.99+% UNIFORM QUALITY ) ZINC

equipment to strains which are as nothing to equipment life.

At any machine tool show, such as will be held in Cleveland, Sept. 11-21, so-called stunts are certain to be played up, for the sales resourcefulness of machine tool organizations will be on exhibition, as well as the cleverness of its engineers. These stunt-forms of sales technique are equally certain to be disparaged, and many persons will express doubt as to their value, either from a shop or a production viewpoint. However, those who recognize that an occasional home-run serves a useful purpose in combination with base hits can hardly be condemned for exhibiting pinch-hitting qualities which serve to register customers at the turnstiles.

The above comment is brought about as a result of recently reading a letter written Oct. 24, 1929, after the last machine tool exhibition, by a manufacturer's representative to his principal, a more or less prominent maker of machine tools. The letter is quoted with very minor omissions, including correct names.

> I saw Mr. Jones of Jones & Jones Mfg. Co. this week to follow up the quotation on machines . . . I was informed that their orders had already been placed for Smith & Co. machines . . . this after the company representatives looked over all of the machines exhibited at the show and witnessed the extreme ability of Smith & Co. equipment.
>
> This demonstrates that it pays at an exposition to put on dramatic stunts—speed, long chips and red hot cutting tools. Any number of machines could have put on the same imagination-stretching circus stuff that Smith put on, but Smith was the only one in our group who was clever enough to pull a P. T. Barnum, death-defying act, and he made his impressions stick. Having accomplished this, he will get quite a few orders.
>
> Pardon my preachment, but when we see these dramatic disp'ays make lasting impressions on mechanics and executives who have the authority to place orders for machine tools,—well, it gives one something to think about.

It has repeatedly been shown that the doing of the unusual, in connection with fabrication or form-conversion of metal shapes, is indicative of a marked degree of maker-confidence, generally resultant from long experimentation with methods, materials and equipments.

If there is held to be too much of the circus in dramatizing accomplishment through display by metal-working equipment, it can equally be held to be asinine that potential users of modern machine tools should be denied effective thrills which have their inception on testing floors in machine-tool-building shops where men, at first speed tests, step back from machines while they wait to see what happens.

Inasmuch as only a moderate percentage of show visitors are really technically minded, and many others are acquainted with only one or two types of machines, it is quite conceivable that a larger national interest in our machine tool industry can be developed through effective display, which features supreme confidence in the mechanical creations of the industry, than is probable of attainment through speed records in r.p.m.'s. or ft. per min., or in split-decimal accuracies, all of which are sufficiently required in the details of modern construction to arouse little other than technical interest.

Extended, built-up interest in the accomplishments of the industry can tend to arouse a wider inclination to defend the economic purposes of its products and to invest in its securities.

## Will Build Generator Sets at Peoria

HARNISCHFEGER CORPN., Milwaukee, and Caterpillar Tractor Co., Peoria, Ill., have made joint announcement of a co-operative arrangement for building Diesel-powered generator sets bearing the trade mark "Harnischfeger-Caterpillar." The sets, offered in capacities ranging from 35 to 60 k. w., are designed to fill all A. C. and D. C. current requirements for service in mines, quarries, construction camps, municipalities, etc. Generators are of the single-bearing type directly connected by link couplings to the Diesel engine and mounted on a substantial cast iron base. The generator units, manufactured in Milwaukee, are shipped to the Caterpillar plant at Peoria for final assembly.

## Progress in Labor Relations

(CONTINUED FROM PAGE 28)

and Steel Institute has just completed a survey of the operation of employee representation plans for the year 1934. The survey as reported in the last issue of *Steel Facts* covers 101 companies which employ more than 90 per cent of the total number on steel payrolls. This survey shows that 89 per cent of the employees in the operating divisions are giving active support to the representation plans in their respective companies. Last summer a somewhat more limited survey showed 86 per cent of employees participating in the plans. The increase in support of these plans is significant when it is remembered that last year was a period in which there was a great deal of discord and unsettlement in industrial relations in many industries.

The survey showed a total of some 15,600 questions arising under representation plans which were settled in a quiet, orderly manner. Of this number, nearly 73 per cent were decided in favor of employees, while only 16.4 per cent were decided in the negative. There were compromises in 6 per cent of the cases and 4.6 per cent of them were withdrawn.

It is particularly significant that more of the questions referred for settlement to joint committees of the employee representatives and management had to do with wages and working conditions than with any other subject. This is proof that representation plans are functioning principally as a method of collective bargaining. The question of safety formed the next largest class of subjects presented.

### Labor Relations Important National Problem

The whole question of labor relations is one of the most important problems before this country today.

In my opinion, the argument is not about collective bargaining—we are all in favor of collective bargaining, and writing collective bargaining into the law of our country simply legalized what had long been recognized as a necessary industrial practice.

The question at issue is the type of collective bargaining which will prove most practical and most beneficial to employees and to employers; which will promote harmony in industrial relationships and contribute greatly to industrial recovery. As an employer, it is my belief, based upon many years of experience, that employee representation plans are the most practical method thus far devised. Employees throughout the steel industry have overwhelmingly shown their preference for employee representation plans. I do not believe these employees will submit to the dictates of those who seek to force upon them, by legislation or otherwise, a type of collective bargaining which the employees have emphatically shown they do not desire. In my opinion, employee representation plans are here to stay—and are proving to be the solution of our problems.